FINAL Data Summary Report Area D Soil Gas Sampling and Analysis



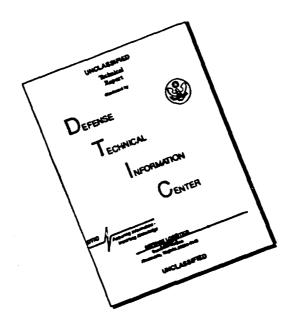


McClellan Air Force Base

Volume II. Data

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FINAL SOIL VAPOR DATA SUMMARY REPORT VOLUME II: DATA

LINE ITEM 0004 OF DELIVERY ORDER 5003 UNDER CONTRACT/ORDER NO. F0469990D00355003

Prepared for McClellan Air Force Base

Prepared by

CHMHILL

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SECTION I SUBCONSULTANT QA/QC REVIEW--CSL

ANALYTICAL REPORT

Section 1 McClellan AFB Close Support Laboratory March 20 - April 12, 1991

Prepared for:

CH₂M Hill

Prepared by:

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1.0 PROJECT DESCRIPTION

1.1 Sample Description

A Close Support Laboratory for the analysis of landfill gas samples by EPA Method TO-14 using full scan GC/MS was established at the McClellan Air Force Base for use by CH2M Hill. The laboratory was designed to analyze approximately 180 landfill samples collected over a one month period. The samples were collected in 800 ml SUMMA canisters provided by the Oregon Graduate Institute (OGI). Section 1 describes the quality assurance program and the analytical methods for the CSL laboratory, and Section 2 contains all of the analytical report sheets by day analyzed.

The laboratory used a HP 5809 GC with a HP 5971 MSD leased for the project from US Analytical Instruments. The GC/MS system was connected to the HP Vectra MS/DOS Chemstation, and the reports were generated by the computer and automatically printed in the form of Excell Spreadsheets. The daily QA/QC reoperts were generated on a second IBC Compatiable computer using LOTUS 123 software.

The laboratory was manned with experienced GC/MS operators who were in charge of the daily QA/QC operations. An additional GC operator supplied by CH2M Hill assisted in the sample analysis. All data was reviewed by a GC/MS operator. The methodology used for analysis and the standard operating procedures are given in Section 1, 2.0.

1.2 Quality Asssurance

A. Project Specific Quality Assurance

Method Blank - A laboratory generated "zero" air sample stored in a SUMMA canister which is analyzed in the morning just after the standards and before any samples are analyzed.

Spikes - Spikes are actual samples that have analyte compounds added in a known amount. For SUMMA canisters a known volume of 5 ppmv gas standard is added to each canister. The recovery of the analytes is then reported as a percent recovery.

Duplicates - For duplicates, a mid or high level sample is analyzed twice to determine the Relative Percent Difference (RPD).

RPD = (Conc. 1 - Conc. 2) x 100
Average Concentration

Standards - NBS traceable standards are analyzed with each sample batch. A 100% standard is analyzed in the morning to verify instrument response, target calibration windows, and initial calibration validity. A 50% calibration standard is analyzed at the end of the day to verify linerity and daily calibration.

1.3 Sample Log Sheets

tab TD.						
Lab ID:	Date	Time	Can No.	Pressure	Description	Rec'd by
3000	3/20/91	1::03	P-10	ष्ठ ् म्	MW-AC-C-019 MW #1 B	
3001	3/20/91		P-1	0"14	MU-AC-C-001	
3002	3/20/91		P.2	· - 0 - Hg	MW-Ac- C-002	
3003	3/20/91		12-3	0"14.	MW-Ac-C-003	-
3004	3/20/91	12:21	P-4	-0.5" Hg	MW-AC-C-008	
3005	3/20/91	12:10	P-5	0" Ha	MW-AC-C-007	
3004	3/20191	12:15	P-6	O"Ha	MW-AC-C - 009	
3007	3/20191	12:30	P-7	0 Ha	MW-AC- C-013	
3008	3/20[9]	12:35	P-8		MW-AC- C-014	
3009	3/20/91	1Z:40·	D-9	1"Ha	MW-AC-C-015	
3010	3/22/91	11:14	P-24	0. Ha	MW-DR-C-1-1	
3011	3/22/91	3:07	P-23	O'Had	MW - DR-C-1-Z	
3012	3/22/91	4:48	P-25	n" Ha	1	
3013	3/22/91	10:37	P-14	0°Ha	MW-DR-C-2-1	
3014	3/23/91	1:47	P.19	0"Ha	MW-DR-C-2-2	
3015	3/23/91	4:54	P-12	0. HS	MW-DR-C-2-3	
3016	3/25/91	10:14	P-20	0:40	MW-DR-C-3-1	
3017	3/25/91	12:55	R-15	o Ha	MW-DR-C-3-2	
3018	3/25/9,	4:57		D" 116	MW-DR-C-3-3	
3019	3/27/91	11:28	0.22	J" A&	MW-PC-C-Z-B	
3020	3/27/91	12:29	i	0° Hox	MW-PC-C-Z-1	
302.	3/27/91		1. 2	2505	100 10 10 10	
200	3/27/91		P-17	30 psi	MIN low	
3	3/27/91		P11	5psi	1.11 1 1 1 2-3	

Lab ID:	Date	Time	Can No.	Pressure	Description	Rec'd by
30211	3/28/91		P50	0	MW-AC-3-1	
3025	3/28/41		P35	0	MW-AC-3-2	
3026	3/28/91		P40	. 0	MW-AC-3-3	
3027	3/28/91		945	0	MW-AC-3-B	
3028	3/29/91		P34	0	MW-HDR-C-1-1	
3029	3/30/91		P39	0	MW-DR-C-7-1	
3030	3/30/91		P30	0	MW-DR-C-7-2	
3031	3/30/91		P44	0	MW-DR-C-7-3	
3032	3/31/91		P48	Ö	MW-DR-C-8-1	
3033	3/31/91		·p-49	. 0	MIN-DR-(-8-)	
3034	3/3/9/		P43	0	MW-DR-C-8-3	
8035	4/1/91	1120	PLE	D	mw-DR-C-9-1	
3036	41,91	1323	P38	2	MW - DR-C-9-2	
3037	41/91	1530	£33	0	MW-DR-C-9-3	
3038	4/2.51	1135	11.42	Ċ	MN-AC-C-7-1	
3039		().70	P 27	(MW-AC-C-7-7.	
3040	4/2/11	17118	V 32	(. ·	MIN -AC-C-7-3	
3041	4/2/91	11-12	11-37	C	MN-AC-C-7-B	
3042	4/2	12.50	47		MW-DR-C-6-1	
3043	4/2	ر ب ک	· 1/4.	3	Mu - DR- 6-6-2	
3044	4/2	14.10	3		Mh-DR-C-6-3	
3049	1 2	174	1 .		Mu-DR-C-6-4	
C046	4 3	1132	10	-:.1/2	MW-AC-C-8-1	
3047	1:13	1216	D 36	-11/2	MN-AC-C-8-2	

Lab ID:	Date	Time	Can No.	Pressure	Description	Rec'd by
3048	4/5	1256	P. 31	-1/2	MW-AC-C-8-3	
3049	413	1047	T-51	<u>.</u>	MN-AC-C-8-B	
3050	4/3	ix153	6 6-2	. <i>C</i> '	MW DR-C-5-1	<u> </u>
3051	1-1/3	1,54	Pris	-1.5	MN DR-6-5-2	-
3052	4/3	13/1	1: 1,2	-1.0	MW-DR-C-5-3	
3053	4/4	1145	P 13	j . 7	MW-AC-C-9-1	
3054	4/4	1218	12.57	-1 7	MW AC C 9-2	
3055	4/4	1369	7-64	-2.C	MW AC-C-9-3	
3056	4/4	1145	F-1.3	- 2.0	MW-AC-C-9-4	
3057	4/4	10.29	で (5	C	MW-AC-C-9-B	
₹058	4/4	3955	1.60	-20	Mu - DR - C - 4-1	ļ
3059	4/4	1151	1' 1/4	-1.6	Mu - DR C 4- Z_	
3060	4/4	1357	12:57	-2 C	MN - DR (4-3	
5061	415	11130	P 7Z		UR-AC-C-31-1	
3062	415	11/5/9	in G	D	VR- AC- C-31-Z	<u> </u>
3063	11/0	1522	1066		1R-AC-C-31-3	
3064	4/63	1346	71	C;	UR-AC-C-31-B	
3065	4/6	1317	P-(-1	()	MW-AC-C6-1	
3066	4/6	1345	1: 6.6	7	MW-AC-C-6-Z	
3067	4/6	1425	Filele	D	Mn -AC-C-6-3	
1 3	4/4	1230	T. (-)	+4.0	MW-AC-C-6-B	
301-0	4/8	1003	P-81	+15 PSi	MW-AC-C-5-B	
30-	4/8	1056	P-73		MW-AC-C-5-1	
3 -	4/8	1126	P-76	0	MW-AC-C-5-2	

Lab ID:	Date	Time	Can No.	Pressure	Description	Rec'd by
3072	4/8	1200	P-70	0	MW-AC-C-5-3	
3013	4/8	1402	P-82	-32	MW-AC-C-4-1	
3074	4/8	1433	P-77	32	MW-AC-C-4-2	
3075	4/8	1524	P-91	-ユ	MW-AC-C4-3	
3076	4/8	1320	P-86	4	MW-AL-C-4-B	
3077	4/8	2080	P-74	4	MW-HDR-C-1-12	
3078	11 8		P-96	2	MM HDR C. 1-3	
3079	4/8		P-75	2	Min' HDE-C-1-4	
3050	419	1148	P-87	0	VR-AC-C-43-1	
30 1	49	1228	P-93	0	VR-AC-C-43-2	
1	4/9	1255	P-88	0	VR - AC-C-43-3	
3,063	4/9	1148	P-98	0	VR-AC-C-43-4	<u> </u>
3(-34	49	1340	P-78	820	VR-AC-C-44-B	
3000	4/9	1419	P-80	0	VR-AC-C-44-1	
2546	4/9	1442	7-84	0	VR-AC-C-44-2	<u> </u>
301.7	4/9	1112	P-93	\$2.0 \$4	VR-AC-C-43-B	
£ 3088	4/9	1504	P-85	0	VR-AC-C-44-3	<u> </u>
3089	4/9	10:10	P-92	30	MW-HDR-C-1-5	
3090	4 9	11:30	197	10	MW-HDR-C-1-6	
3091	4/10	11:20	Pin	+27%1	HW - HDR-C-7-1	
3092	4/10	1258	PIIL	0	VR-AC-C-61-2	
3093	4/10	1040	P100	0	VR-AC-C-42-Z	
3094	14/10	1110	P95	0	VR-AC-C-42-3	
3095	14/10	1236	P99	0	VR-AC-C-61-4	

Lab ID:	Date	Time	Can No.	Pressure	Description	Rec'd by
3096	4/10	925	P79	0	VR-AC-C-42-B	
3097	4/10	1002	P90	0	VR-AC-C-42-1	
		1210	P106	٥ ٠	VR-AC-C-61-B	
3099	4/10	1236	PIII	0	VR-AC-C-61-1	•
3100	4/10	1320	P101	0	VR-AC-C-61-3	
3101	4/10	1414	P122	D	VR-AC-C-34-B	
3102	4/10	1440	P124	5	1R-AC-C-34-1	
3103	4/10	1503	P148	· Z	VR-AC-C-34-Z	
3104	4/10	1529	923	18	VR-AC-C-34-3	
3105	4/10	1224	PIZI	2.5	MW-12-C-7-2	
3108		1247	P94	2.5	Mw- 402-C-9-11	7
3107	4/10	17:07	P117	3.2131	MW-HDR-C-9-2	
3108	4/10	1050	P103	215	VR-AC-C-35-B	
3109	4/4	1122	PIIZ	26	VR-PC-C-35-4	
3110	4/11	1172	P109	0	VR-AC-C-35-1	
3111	4/11	1145	P113	26	VR-PC-C-35-5	
3112	14/11	1146	P104	0	VR-AC-C-35-Z	
3113	4/11	1212	P108	0	VE-AC-C-35-3	
2114		1119	2107	15	MW-HDR-8-7-3	
3115	4)11	1233	P102	15	MW- HDR-0-7-4	
3116	4/11		P127	1	MW-HDR-C-9-3	
317	4/11	1418	P128	0	VR-AC-C-39-1	
71 .	14/11	1452	P124	0	VR-AC-C-39-2	
3	14/1	11575	PBILL	10	VR-AC-C-39-3	

Lab ID:	Date	Time	Can No.	Pressure	Description	Rec'd by
3120	4/11	1357	P105	2	VR-AC-C-39-B	
3121	4/11	1534	P146	2_	1 F- 12-2-36-B	
£ 2	4/11		P110		10 h 11 - 11 - 06 - 1	
2 - :	4/11	1	PIZO	-2	VR-AC-C-36 2	ļ·
Gina	4/11	1634	P44145	-2	VR-AC-C-36-3	
3124	4 /	1600	P119	+30	VF. PC- C-36-4	<u> </u>
3126	4/11	1634	P125	+25	VR PC- C- 36-5	
3127	4/11	1000	P115	+10	MW-AG-C-9-4	
3128	4/12	11.36	115	0	VR-AC-0-13-B	
3129	4/12	12:19		<i>U</i>	VR-AC-C-13-1	ļ
3130	4/12	1	r135	1-2	VR-AC-C-13-2	
3131	4/12	12.00	81.19	-1	VR-AC-C-13-3	
3132	4/12		<u> </u>		VR-AC-C-13-3	
3133		HO:40		-7	AA - AC - C - 1	
3134	T	16'40	1	1-2	AA-AC-C-Z	<u> </u>
3135	4/12		1129	1-/	MW-LFAC-C-7-1	
3136	4/12			/	MW-4AC-C-7-2	
3137	4/12	+'	F134	-/	MW-LFAC- C- Z-1	
3138	4/12	14:20	F133	1-1	MW-LFAC-C-2-3	2
3139	1/12		139	_/_/	VK-AC-C-13-5	
3140	4/12	12:19	11-18	1-1	Vr-AC-C-13-4	
3141	4/12		P130		MW-4FAC-C-2-3	
3142	4/12	14:4	7 P138	-1	MW-LFAC-C-Z-4	

2.0 ANALYTICAL METHODS

2.1 Introduction to Analytical Methodology

The samples were analyzed using EPA Method TO-14 for ambient air with full scan GC/MS as described in the initial proposal.

2.2 Description of Analytical Methods

Volatile Organic Compounds by GC/MS

The samples were analyzed by EPA proposed Method TO-14 for ambient air sampling and analysis. The method uses cryotrapping to preconcentrate the air and gas samples which are separated on a fused silica capillary column and analyzed by full scan gas chromatography/mass spectrometry A 500 to 1000 ml ambient air sample or a 1.0 to (GC/MS). 20.0 ml landfill gas sample is transferred from the air sampling container to the freezout loop is immersed in liquid oxygen and concentrates the sample. The sample is desorbed from the cryotrap at 85C and is cryofocussed onto the beginning of a narrow bore 30 meter fused silica capillary column with a 1.0 micron phase loading. column is temperature programmed to 200 C. spectrometer is scanned from 33 AMU. The GC/MS is tuned and operated according to the specifications in EPA SW-846 Method identified 8240. Target compounds are quantitated from extracted ion chromatograms using two characteristic ions and retention times. Additional tentatively identified compounds (TIC'S) are identified using a PBM computer search of the NIST 49,000 compound library. The method detection limit (MDL) is listed on the analytical report, and the reproducibility of the method is about 10-15% for most compounds at 1 ppbv.

2.2 Standard Operating Procedures

STANDARD OPERATING PROCEDURE Close Support Laboratory March 25, 2991

DAILY START-UP PROCEDURE:

- 1) Turn on power strip for pump and hot pot.
- 2) Turn on Valydyne pressure gauge.
- 3) Cap canister intake connector.
- 4) Turn on Zero air cylinder, open the three toggle valves to flush system. Turn Three Way Valve to Camilla 10 PSi
- 5) Check Helium Cylinder, change is below 500 lbs.
- 6) Autotune GC/MS.
- 7) Set-up daily file folder.
- 8) Start Daily Sample Log for GC/MS.
- 9) Turn on CO2 cylinder, and collect liquid oxygen for traps using stainless steel thermous.
- 10) Turn on secondary computer and load daily QA report.
- 11) Load Method in GC/MS system.
- 12) Do intial daily QA check.

File Names:

B - Blank

S - Standard

Q - QA Sample

Standard, Blank, QA

Year

 \underline{S} $\underbrace{0 \ 3 \ 2 \ 9 \ 1}_{A} A \frac{1}{W} \cdot D$

Date Method Run Number (1st STD is 1, 2nd STD that day is 2)

Method

A - T014L

B - TO14

<u>Sample</u>

Method

3 0 0 2 Å 1 . D

Lab ID Run number

STANDARD OPERATING PROCEDURE

Close Support Laboratory March 29, 2991

DAILY ANALYSIS PROCEDURE:

- 1) Start Machine using Daily Start-Up Procedure.
- 2) Check Auto Tune. EM about 1500 1800 emv
- 3) Run Daily 100% Standard.
 - Use Method T014
 - Use 20 ml Volume of 100 ppbv Standard
 - Check Printout of Standard against Previous Standard
 - Use this Standard to Update Calibration Table on Method TO14 and TO14L.
 - Get Tabulated Spectrum of BFB and enter into Daily QA Report in LOTUS 123 (QATP)
- 4) Run Daily Blank
 - Analyze a 200 ml Zero Air Blank
 - Use Method T014
 - Process using Methods T014 and T014L
 - The Field Blank can be used for this if it is Clean
 - If the Field Blank has components above the MDL Run a Zero Air Blank.
 - Enter Blank Values into Daily QA Report.
- 5) Analyze Samples
 - Analyze ALL samples using TO14L with 200 ml Volume to get Lowest MDL. On TO14L the MS turns off from 8.5 to 10 min to avoid large F-113 peak.
 - Do not pressurize the canister unless canister pressure is less then 10" Vacuum, or a duplicate is to be run on zero pressure canister. (See Pressurization SOP)
 - Follow Data Analysis Protocal for each sample run.
 - Analyze the first sample in duplicate and enter results in Daily QA Report.
 - Analyze additional samples once.
 - Analyze Selected Canisters (by CH2M) by Method T014 using 20 ml (canister has to have positive pressure).

STANDARD OPERATING PROCEDURE Close Support Laboratory March 25, 2991

DAILY STANDARDIZATION PROCEDURE:

- 1) Load Method in GC/MS System.
- 2) Uncap Standard and Internal Standard Cylinders.
- 3) Place loop valve in position to load desired loop. Normally the 10.0 ml top loop will be used.
- 4) Connect standard line to 100 ppbv standard cylinder.
- 5) Flush loop and line with standard. Flush with enough volume to flush regulator.
- 6) Close exit toggle valve (Valve 2).
- 7) Verify trap is in the load position.
- 8) Close Vacuum toggle valve (valve 3).
- 8) Place dewar of liquid oxygen on cryo trap, and let cool.
- 9) Open valve and flush loop.
- 10) Open Exit toggle Valve (Valve 2).
- 11) Switch loop valve to alternate loop position.
- 12) Connect internal standard to sample line.
- 13) Flush loop with internal standard.
- 14) At a pressure of 250 switch loop valve to alternate loop position.
- 15) Connect sample line to Standard to load additional 10 ml (for 20 ml standard size).
- 16) At a pressure of 300 switch loop valve to alternate loop position.
- 17) Continue loading with zero air to a pressure of 400.
- 18) At pressure of 400 close the Zero Air toggle valve (Valve 1) and then close the Exit Toggle valve (Valve 2).
- 19) Place a loop of capillary column into dewar of liquid oxygen for cryofocus.

- 19) Pour hot water, switch cryotrap Valve to inject, take liquid oxygen off cryo trap and replace with hot water.
- 20) Time for 2.5 minutes. After 1 min has passed, turn on GC oven cryo to cool oven.
- 21) After 2.5 minutes switch Cryotrap Valve to load.
- 22) Open the three toggle valves to flush with zero air.
- 23) When oven is at temperature, press start run, and pull out capillary column.

STANDARD OPERATING PROCEDURE

Close Support Laboratory March 29, 2991

DAILY ANALYTICAL PROTOCOL:

- 1) Analyze 20.0 ml of a 100 ppbv Standard for the 100% Standard using Method TO14.
 - a) Tabulate BFB in Standard
 - b) Print Extracted Ion Report
 - c) Compare with previous days standard.
 - c) Print Chromatogram and Visually Compare.
 - d) Update Calibration Table
 - e) Enter BFB, and Standard Areas in Daily QA Report Spreadsheet and check RRF.
 - f) If BFB or RRF does not meet criteria for more then 2 compounds then rerun Standard.
- 2) Analyze 200 ml of Blank using Method TO14.
 - a) Enter Blank areas into spreadsheet to verify levels are below MDL for method.
 - b) If level above MDL run another blank. Exception would be for F-113 when TO14L Method to be used.
- 3) Load Method TO14L for all samples. Note: Some samples are to be analyzed at 20.0 ml for higher compounds as desired by CH2M personnel.
 - a) Analyze 200 ml of Samples.
 - b) Analyze one Sample in Duplicate (This sample should be pressurized before analysis to have enough sample). Duplicates should be +/- 50% for compounds above 2 ppbv. If not reanalyze sample to problem.
 - c) Check Excell Report
 - d) Modify Report for volume or pressure
 - e) Print out TIC chromatogram
 - f) Verify peak shape
 - g) Proceed with next sample analysis

STANDARD OPERATING PROCEDURE

Close Support Laboratory March 29, 2991

DATA ANALYSIS/POST RUN FILE MANAGEMENT PROCEDURE: For Each Sample Run Do The Following.

NOTE: Be careful not to save an individual modified file over the defalt processing file: TO14.XLS or TO14L.XLS. If this happens reload method from floppy disc.

UPDATE DAILY CALIBRATION:

- 1) After Standard is Run and automatically processed against the previous days standard (Method TO14), review the results to verify that all compounds are found and are near 100 ppbv +/- 50%.
- 2) Obtain a BFB Tabulated Spectra to enter Daily QA Report.
 - a) Open DATAANALYSIS.
 - b) Click on FILE and LOAD DATA FILE
 - c) Zoom in on peak as described in Section 4a above.
 - d) Drag cursor to peak desired and double click on RIGHT mouse button.
 - h) To get a Tabulation of Spectrum (BFB) click SPECTRA and TABULATE SPECTRA.
- 3) Get a Printout of the Standard Chromatogram.
 - a) Use the Mouse to zoom in on TIC. Put mouse in left corner of chromatogram and press the left button and hold. Drag box up to le+07 and to 16 min. Release button.
 - b) Click on GRAPHICS and PRINT SELECTED WINDOW.
 - c) Select window 2 and click OK.
 - d) Wait for Chromatogram to print.
- 4) For Calibration Update, Open DATA ANALYSIS
- 4) Open FILE and click on LOAD FILE, then select file name (should be defalt), and click OK.
- 5) Open QUANT REPORT and click on ADD/UPDATE CALIBRATION LEVEL.
- 6) Select your standard file for File for Update Calibration (should be the defalt file).

 ... Reflace (Ant Adult 66)
- 7) RECALIBRATE (X ALL THREE BOXES) DO UPDATE, SAVE TO METHOD 8) LOAD METHOD TO 14 L AND REPEAT STEPS 4-7. SAVE TO METHO POST RUN FILE MANAGEMENT
- 1) After the Computer has printed out the preliminary Excell Spreadsheet, is the best time to save and modify it.

- 2) If no volume or pressure corrections are to be made. Then just save the file and print duplicate copy.
- 3) For post run data processing click on DATAANALYSIS. Click on FILE and make sure the desired file is the defalt. If not click on LOAD DATA FILE.
 - a) Open CUSTREPORT and click on RUN EXCEL
 - b) Click on FILE and OPEN
 - c) Select TO14 or TO14L and click OK
 - d) Click on FILE and PRINT
 - d) Click on FILE and SAVE AS
 - e) Save on A Drive as A:3xxx where 3xxx is the Lab Number.
 - f) Click on FILE and EXIT.
 - g) Do not save changes as TO14.XLS if it asks for it.
- 3) If a volume or pressure correction is to be made.
 - a) Open CUSTREPORT and click on CREATE/MODIFY TEMPLATE.
 - b) Select TO14L or TO14
 - c) Enter Modifications by typing numbers in appropriate boxes in spreadsheet.
 - d) Click on FILE and EXCELL MAIN MENUE.
 - e) Print File by Clicking again on FILE and PRINT, select 2 copies and click OK.
 - f) Verify report results.
 - g) Save report to floppy, by clicking on FILE and SAVE... Where it asks for file name type A:3xxx where 3xxx is the Lab Number.
 - h) Click on FILE and EXIT.
- 4) Print out Chromatogram.
 - a) Use the Mouse to zoom in on TIC. Put mouse in left corner of chromatogram and press the left button and hold. Drag box up to le+07 and to 16 min. Release button.
 - b) Click on GRAPHICS and PRINT SELECTED WINDOW.
 - c) Select window 2 and click OK.
 - d) Wait for Chromatogram to print.
- 5) Verify that the report matches chromatogram. Sometimes peaks that are large and have a poor shape will not appear on report. If this is the case manually integrate peak, calculate result and enter in Excell spreadsheet and reprint.

CPTIONAL DATA ANALYSIS.

- 1) To print a mass spectrum of a peak.
 - a) Open DATAANALYSIS.

- b) Click on FILE and LOAD DATA FILE
- c) Zoom in on peak as described in Section 4a above.
- d) Drag cursor to peak desired and double click on RIGHT mouse button.
- e) Click on GRAPHICS and PRINT SELECTED WINDOW.
- f) Select window 1 and click OK.h) To get a Tabulation of Spectrum (BFB) click SPECTRA and TABULATE SPECTRA.

STANDARD OPERATING PROCEDURE

Close Support Laboratory March 25, 2991

DAILY SHUT-DOWN PROCEDURE:

- 1) Turn off the three toggle valves, and the 3 way valve to pressure gauge.
- 2) Turn off Valydyne pressure gauge.
- 3) Turn off power strip for pump and hot pot.
- 4) Turn off the Zero air cylinder.
- 5) Leave Helium Cylinder on, but change if it is below 500 lbs.
- 6) Turn off CO2 cylinder.
- 10) Turn off secondary computer.
- 11) Verify Cryo option on GC is off.
- 12) Check that caps are on standard and internal standard cylinders.
- 13) Turn off lights and lock doors.

Congrate white to forty and

FOR DATAFILE BACKUPS

- 1) Open Program Manager.
- 2) Open File Manager.
- 3) Click on \BC to get Drive C Contents.
- 4) Click on CHEMPC (C:\CHEMPC\DATA\).
- 5) Click on DATA.
- 6) Click on FILE NAME (Actually a Directory).
- 7) Click on FILE, COPY TO: A: then click on COPY.
- 8) Each file takes one HD Floppy.
- 9) Click on FILE, DELETE Make sure correct file is to be deleted, click on DELETE, YES, YES, YES, YES at prompts.
- 10) Do next file.

100ml/min

Pressurize Canister

- 1) Shut off all toggles.
- 2) Put canister on measurement valve.
- 3) 3-way valve to sample position.
- 4) Turn on 3-way canister valve.
- 5) Open canister valve and measure pressure.
- 6) Close canister 3-way valve.
- 7) Close canister valve.
- 8) Open zero air toggle.
- 9) Open canister valve to pressurize (approx. 3 seconds).
- 10) Close zero air toggle.
- 11) Open canister 3-way valve to measure pressure on canister.
- 12) Close canister valve.
- 13) Close 3-way valve.
- 14) Return canister to sampling mount.
- 15) 3-way pressure valve to zero air.

Analyzing the Canister

Load chemstation method and include:

- Canister Number
- Sample description

Run Method

- 1) Put 3-way valve to zero air position.
- 2) Turn all toggles off.
- 3) Put water in heater.
- 4) Make sure 2ml loop is in the load position.
- 5) Make sure V2 is in the load position.
- 5) Check source vacuum 6-8 x 10⁻⁵
- 6) Put canister on sample mount.
- 7) Open canister.
- 8) Open front toggle to flush system with sample. Flush until vacuum is at 200 torr and shut toggle off.
- 9) Add cryo to the trap and cool until bubbling stops.
- 10) Open front toggle to start loading the trap.
- 11) Load the ISTD.
- 12) At 300 torr, add capillary loop to cryogenic.
- 13) At 350 torr inject ISTD.
- 14) At 400 torr turn off front toggle.
- 15) Record sample volume.
- 16) Shut off canister valve.

POUR HOT WATER

Inject V2
Put trap in hot water
Start Timer
At 1.0 minutes turn on cryo

At 2.5 minutes V2 to load (if oven at set point)

- Start RUN

- Take capillary loop out of cryogenic Open all toggles to flush system. Keep trap in Hot $\rm H_2O$. After 10ml loop has flushed, rotate valve to 2ml loop load. Turn cryo off. Monitor source vacuum to possibly over ride solvent delay.

Follow Post Run File Management Instructions.

- -Modify Excell Spreadsheet if needed.
- 2) -Print Extra Excell Spreadsheet
- 3) -Save Excell Spreadsheet on A: floppy (even if no changes were made)
- 4) -Print the chromatogram for each RUN.
- 5) -Verify report matches chromatogram.

2.3 Analytical Methods

The following are printouts of the two methods used for analysis of the landfill gas samples by the CSL.

TO14 - Method for full scan analysis of low level landfill gas samples. This method reports all 17 target compounds. The method could not be used for samples with high concentrations of Freon 113 since the source pressure of the mass spectrometer would rise to a level that the analyzer would shut-off and abort the run.

TO14L - Method for full scan of high level landfill gas samples. This method would automatically turn off the mass spectrometer electronics during the time the Freon 113 peak eluted to avoid a shut down of the analyzer. The method picked up all target compounds except Freon 113 and those compounds that elute close to it (1,1-Dichloroethene and Dichloromethane). With this method large volumes of sample could be loaded to get low detection limits (less then lppbv) without instrument shut-down.

TOPLEVEL PARAMETERS

METHOD TO14 20ml Samples

Method Information For: C:\CHEMPC\METHODS\T014.M

ethod Sections To Run:

() Save Copy of	Method	With	Data
------------------	--------	------	------

() Pre-Run Cmd/Macro =

() Data Acquisition

(X) Data Analysis

() Post-Run Cmd/Macro =

Method Comments:

Close Support Laboratory Analytical Method for Analysis of Air and Landfill Gas Samples by EPA Method TO-14.

END OF TOPLEVEL PARAMETERS

ACQUISITION PARAMETERS

neral Information

Inlet : GC
Tune File : ATUNE.U Acquisition Mode : Scan

Injector Information

Injection Source : Manual

[Purge Information]

Purge A/B Init. Value On Time Off Time Off 0.75 0.00 λ 0.00 On 0.00 В

Temperature Information

cone Temperatures]

Page: 1 Thu Mar 28 11:13:28 1991 Method: TO14.M

Det. A: 50 C Off

Det. B : 280 C

Inj. A: 250 C Off Inj. B: 250 C Off

[Oven Parameters]

Oven Equib Time : 0.10 min Oven Max : 275 C Cryo : Off Oven : On

[Oven Program]

Initial Temp. : -10 C Initial Time : 2.00 min

Level Rate (C/min) Final Temp. (C) Final Time (min)

175 3.70

1 15.00 2 0.00 0.00

Next Run Time : 18.03 min

MS Information -- -------

Solvent Delay : 4.00 min.

EM Absolute : False EMV Offset : 0.0 Resulting Voltage: 1635.2

[Scan Parameters]

Low Mass : 48

High Mass : 200
Sampling # : 3 A/D Samples 8
Threshold : 500

[Real Time Plot Parameters]

Plotting Active : True Time Window : 10 min Total Ion Max : 2000000

END OF ACQUISITION PARAMETERS

DATA ANALYSIS PARAMETERS

Method: TO14.M Thu Mar 28 11:13:28 1991 Page: 2 Method Name: C:\CHEMPC\METHODS\T014.M

Percent Report Settings

Sort By: Retention Time

Output Destination

Screen: No Printer: Yes File: No

Integration Events: events.e

Generate Report During Run Method: Yes

Signal Correlation Window: 0.020

Qualitative Report Settings

Peak Location of Unknown: Apex

Library to Search Minimum Quality

0

Integration Events: AutoIntegrate

Report Type: Summary

Output Destination

Screen: No Printer: Yes File: No

Generate Report During Run Method: No

Quantitative Report Settings

Report Type: Area Percent by Retention Time

Output Destination

Screen: No Printer: Yes

File: detail.xls

Generate Report During Run Method: Yes

Method: T014.M Thu Mar 28 11:13:28 1991 Page: 3

CH2M HILL

Calibration Last Updated: Thu Mar 28 11:11:34 1991

Internal Standard

Reference Window: 5.00 Percent Non-Reference Window: 5.00 Percent Correlation Window: 0.03 minutes

Default Multiplier: 1.00 Default Sample Amount: 0.00

Compound Information

1) Freon-12 (001)

Ret. Time 4.43 min., Extract & Integrate from 3.98 to 5.25 min.

 Signal
 Rel Resp.
 Pct. Unc.(rel)
 Integration

 Tgt
 85.00
 *** AUTO ***

 Q1
 87.00
 32.30
 20.0
 *** AUTO ***

Lvl ID Amt (ppbv) Response 1 101.000 13595098

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv

Curve Fit: Avg. RF

2) Vinyl Chloride (001)

Ret. Time 5.75 min., Extract & Integrate from 5.50 to 6.25 min.

 Signal
 Rel Resp.
 Pct. Unc.(rel)
 Integration

 Tgt
 62.00
 *** AUTO ***

 Q1
 64.00
 32.00
 20.0
 *** AUTO ***

Lvl ID Amt (ppbv) Response 1 100.000 2457273

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv

Curve Fit: Avg. RF

3) Freon-11 (001)

Ret. Time 8.27 min., Extract & Integrate from 8.00 to 9.00 min.

 Signal
 Rel Resp.
 Pct. Unc.(rel)
 Integration

 Tgt 101.00
 *** AUTO ***

 Q1 103.00
 63.90
 20.0
 *** AUTO ***

Lvl ID Amt (ppbv) Response 1 101.000 20820387

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv

Curve Fit: Avg. RF

Method: T014.M Thu Mar 28 11:13:28 1991 Page: 4

```
Ret. Time 9.16 min., Extract & Integrate from 8.91 to 9.41 min.

      .ignal
      Rel Resp.
      Pct. Unc.(rel)
      Integration

      Tgt
      96.00
      *** AUTO ***

      Q1
      61.00
      116.60
      20.0
      *** AUTO ***

                                        *** AUTO *** .
Lvl ID Amt (ppbv) Response
         108.000 8147575
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
                                            ( 001)
 5) Freon-113
Ret. Time 9.41 min., Extract & Integrate from 8.50 to 9.90 min.
Signal
          Rel Resp. Pct. Unc.(rel) Integration
Tqt 151.00
                                        *** AUTO ***
Q1 101.00 140.80 20.0
                                        *** AUTO ***
Lvl ID Amt (ppbv) Response
        105.000 11964189
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
Dichloromethane
                                            ( 001)
Ret. Time 9.53 min., Extract & Integrate from 9.00 to 9.90 min.
          Rel Resp. Pct. Unc.(rel) Integration *** AUTO ***
Signal
Tqt 84.00
    49.00 94.30 20.0 *** AUTO ***
Q1
Lvl ID Amt (ppbv) Response
        107.000
                    5284088
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
7) 1,1-Dichloroethane
                                          ( 001)
Ret. Time 10.58 min., Extract & Integrate from 10.33 to 10.99 min.
Signal Rel Resp. Pct. Unc.(rel) Integration
                                        *** ĀUTO ***
Tgt 63.00
Q1 65.00 31.90 20.0
                                        *** AUTO ***
Lvl ID Amt (ppbv) Response 109.000 11254168
 Walifier Peak Analysis ON ISTD amount: 10.000 ppbv
```

Method: T014.M Thu Mar 28 11:13:28 1991 Page: 5

4) 1,1-Dichloroethene

(001)

```
Curve Fit: Avg. RF
                                    ( 002)
8) 1,2-Dichloroethene
Ret. Time 11.27 min., Extract % Integrate from 10.10 to 11.75 min.
Signal Rel Resp. Pct. Unc.(rel) Integration
                                    *** AUTO ***
Tgt 96.00
            97.00 20.0
                                    *** AUTO ***
    61.00
Q1
Lvl ID Amt (ppbv) Response
1 101.000 429215
                   4292151
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
9) Bromochloromethane
                                   (*ISTD001)
Ret. Time 11.48 min., Extract & Integrate from 11.02 to 12.02 min.
Signal
        Rel Resp. Pct. Unc. (rel) Integration
Tgt 128.00
                                    *** AUTO ***
Lvl ID Amt (ppbv) Response
        10.000 8053774
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
                                     ( 001)
10) Chloroform
Ret. Time 11.49 min., Extract & Integrate from 11.24 to 11.90 min.
Signal
         Rel Resp. Pct. Unc.(rel) Integration *** AUTO ***
Tgt 83.00
Q1 85.00 65.80 20.0
                                    *** AUTO ***
Lvl ID Amt (ppbv) Response
        103.000 14584849
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
                                      ( 002)
11) 1,1,1-Trichloroethane
Ret. Time 12.15 min., Extract & Integrate from 11.90 to 12.55 min.
         Rel Resp. Pct. Unc.(rel) Integration
Signal
Tat 97.00
                                    *** AUTO ***
    99.00 64.20 20.0
                                   *** AUTO ***
Q1
Lvl ID Amt (ppbv) Response
```

Method: T014.M Thu Mar 28 11:13:28 1991 Page: 6

14086301

103.000

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 2) 1,2-Dichloroethane (002) Ret. Time 12.18 min., Extract & Integrate from 11.93 to 12.43 min. Signal Rel Resp. Pct. Unc.(rel) Integration Tgt 62.00 Q1 64.00 32.00 20.0 *** AUTO *** *** AUTO *** Lvl ID Amt (ppbv) Response 105.000 10792517 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF (002) 13) Benzene Ret. Time 12.51 min., Extract & Integrate from 12.26 to 12.95 min. Signal Rel Resp. Pct. Unc.(rel) Integration Tgt 78.00 *** AUTO *** Lvl ID Amt (ppbv) Response 1 108.000 15947214 1 Pualifier Peak Analysis ON ISTD amount: 10.000 ppbv urve Fit: Avg. RF 14) Carbon Tetrachloride (002) Ret. Time 12.54 min., Extract & Integrate from 12.29 to 12.90 min. Signal Rel Resp. Pct. Unc.(rel) Integration Tqt 117.00 *** AUTO *** Q1 119.00 95.90 20.0 *** AUTO *** Lvl ID Amt (ppbv) Response 100.000 17118746 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv

15) 1,4-Difluorobenzene (*ISTD002)

Ret. Time 12.75 min., Extract & Integrate from 12.54 to 13.60 min.

Signal Rel Resp. Pct. Unc.(rel) Integration
Tgt 114.00 *** AU'O ***

vl ID Amt (ppbv) Response 10.000 97113510

Curve Fit: Avg. RF

Method: T014.M Thu Mar 28 11:13:28 1991 Page: 7

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 16) Trichloroethene (002) Ret. Time 13.24 min., Extract & Integrate from 12.99 to 14.00 min. Signal Rel Resp. Pct. Unc.(rel) Integration
Tgt 130.00 *** AUTO *** Q1 132.00 96.00 20.0 *** OTUA *** Lvl ID Amt (ppbv) Response 96.000 10250028 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 17) Toluene (002) Ret. Time 14.57 min., Extract & Integrate from 14.32 to 15.25 min. Rel Resp. Pct. Unc.(rel) Integration *** AUTO *** Signal Tgt 92.00 Q1 91.00 166.60 20.0 *** AUTO *** Lvl ID Amt (ppbv) Response 98.000 15491979 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 18) Tetrachloroethene (002) Ret. Time 15.45 min., Extract & Integrate from 15.20 to 16.00 min. Signal Rel Resp. Pct. Unc.(rel) Integration Tgt 164.00 *** AUTO *** Q1 166.00 129.70 20.0 *** AUTO ***

END OF DATA ANALYSIS PARAMETERS

Method: T014.M Thu Mar 28 11:13:28 1991

12874108

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv

Lvl ID Amt (ppbv) Response 106.000

Curve Fit: Avg. RF

TOPLEVEL PARAMETERS

METHOD TO14L 200ML Samples

Method Information For: C:\CHEMPC\METHODS\T014L.M

ethod Sections To Run:

() Save Copy of Method With Data

() Pre-Run Cmd/Macro =

(X) Data Acquisition

(X) Data Analysis

() Post-Run Cmd/Macro =

Method Comments:

Close Support Laboratory Analytical Method for Analysis of Air and Landfill Gas Samples by EPA Method TO-14.

END OF TOPLEVEL PARAMETERS

ACQUISITION PARAMETERS

neral Information _____

: GC Inlet

: ATUNE.U Tune File Acquisition Mode : Scan

Injector Information

Injection Source : Manual

[Purge Information]

Init. Value Purge A/B On Time Off Time Off 0.00 λ 0.75 0.00 On В 0.00

Temperature Information

Zone Temperatures]

Method: TO14L.M Wed Mar 27 10:43:29 1991

Det. A: 50 C Off

Det. B : 280 C

Inj. A: 250 C Off Inj. B: 250 C Off

[Oven Parameters]

Oven Equib Time : 0.10 min Oven Max : 275 C Cryo : Off Oven : On

[Oven Program]

Initial Temp. : -10 C Initial Time : 2.00 min

Level Rate (C/min) Final Temp. (C) Final Time (min)

15.00 1 175 3.70

2 0.00

Next Run Time : 18.03 min

MS Information

-- -------

Solvent Delay : 4.00 min.

EM Absolute : False EMV Offset : 0.0 Resulting Voltage : 1588.1

[Scan Parameters]

Low Mass : 48

High Mass : 200 Sampling # : 3 A/D Samples 8

Threshold: 500

[Real Time Plot Parameters]

Plotting Active : True Time Window : 10 min Total Ion Max : 2000000

Run Table Entries --- -----

State (MS on/off) time (min) Off 8.50 10.00

On

Method: TO14L.M

Wed Mar 27 10:43:29 1991

END OF ACQUISITION PARAMETERS

DATA ANALYSIS PARAMETERS

Method Name: C:\CHEMPC\METHODS\T014L.M

Percent Report Settings

Sort By: Retention Time

Output Destination Screen: No Printer: Yes

File: No

Integration Events: events.e

Generate Report During Run Method: Yes

Signal Correlation Window: 0.020

Qualitative Report Settings

Peak Location of Unknown: Apex

Library to Search Minimum Quality

0

Integration Events: AutoIntegrate

Report Type: Summary

Output Destination

Screen: No Printer: Yes File: No

Generate Report During Run Method: No

Quantitative Report Settings

Report Type: Area Percent by Retention Time

Method: T014L.M Wed Mar 27 10:43:29 1991 Page: 3

Output Destination Screen: No Printer: Yes File: detail.xls Generate Report During Run Method: Yes CH2M HILL Calibration Last Updated: Wed Mar 27 10:19:29 1991 Internal Standard Reference Window: 5.00 Percent Non-Reference Window: 5.00 Percent Correlation Window: 0.03 minutes Default Multiplier: 1.00 Default Sample Amount: 0.00 Compound Information 1) Freon-12 (001) Ret. Time 4.42 min., Extract & Integrate from 3.90 to 5.25 min.
 Signal
 Rel Resp.
 Pct. Unc.(rel)
 Integration

 Tgt
 85.00
 .
 *** AUTO ***

 Q1
 87.00
 30.00
 20.0
 *** AUTO ***
 *** AUTO *** *** AUTO *** Lvl ID Amt (ppbv) Response 101.000 13595098 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF

2) Vinyl Chloride (001)

Ret. Time 5.75 min., Extract & Integrate from 5.50 to 6.25 min.

 Signal
 Rel Resp.
 Pct. Unc.(rel)
 Integration

 Tgt
 62.00
 *** AUTO ***

 Q1
 64.00
 28.50
 20.0
 *** AUTO ***

Lvl ID Amt (ppbv) Response 1 100.000 2457273

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF

3) Freon-11 (001)

Ret. Time 8.26 min., Extract & Integrate from 7.99 to 8.99 min.

Method: T014L.M Wed Mar 27 10:43:29 1991 Page: 4

```
Signal Rel Resp. Pct. Unc.(rel) Integration
Tgt 101.00
                                    *** AUTO ***
QI 103.00 63.60 20.0
                                    *** AUTO ***
/l ID Amt (ppbv) Response
        101.000
                  2082038
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv.
Curve Fit: Avg. RF
                                       ( 001)
4) 1.1-Dichloroethane
Ret. Time 10.58 min., Extract & Integrate from 10.33 to 10.99 min.
Signal Rel Resp. Pct. Unc. (rel) Integration
                                     *** AUTO ***
Tgt 63.00
Q1 65.00 30.30 20.0
                                    *** AUTO ***
Lvl ID Amt (ppbv) Response
        109.000 11254168
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
 5) 1,2-Dichloroethene
                                  ( 002)
Ret. Time 11.26 min., Extract & Integrate from 10.10 to 11.75 min.
          Rel Resp. Pct. Unc.(rel) Integration *** AUTO ***
 .gnal
gt 96.00
21 61.00 106.70 20.0
                                    *** AUTO ***
Q1
Lvl ID Amt (ppbv) Response
                   4292151
         101.000
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
 6) Bromochloromethane
                                        (*ISTD001)
Ret. Time 11.48 min., Extract & Integrate from 11.02 to 12.02 min.
Signal
          Rel Resp. Pct. Unc. (rel) Integration
Tgt 128.00
                                     *** AUTO ***
Lvl ID Amt (ppbv) Response
          10.000 8053774
1
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
 chloroform
                                        ( 001)
```

Ret. Time 11.48 min., Extract & Integrate from 11.23 to 11.90 min.

Wed Mar 27 10:43:29 1991

Page: 5

Method: TO14L.M

Rel Resp. Pct. Unc.(rel) Integration *** AUTO *** Signal Tgt 83.00 **85.00 64.70** 20.0 *** AUTO *** Q1 Lvl ID Amt (ppbv) Response 103.000 14584849 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 8) 1,1,1-Trichloroethane (002) Ret. Time 12.14 min., Extract & Integrate from 11.89 to 12.55 min. Signal Rel Resp. Pct. Unc.(rel) Integration Tgt 97.00 *** AUTO *** 99.00 64.20 20.0 *** AUTO *** Q1 Lvl ID Amt (ppbv) Response 1 103.000 14086301 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 9) 1,2-Dichloroethane (002) Ret. Time 12.17 min., Extract & Integrate from 11.92 to 12.50 min. Signal Rel Resp. Pct. Unc.(rel) Integration Tgt 62.00 *** AUTO *** **64.00** 29.50 20.0 Q1 *** AUTO *** Lvl ID Amt (ppbv) Response 1 105.000 10792517 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 10) Benzene (002) Ret. Time 12.50 min., Extract & Integrate from 12.25 to 12.95 min. Signal Rel Resp. Pct. Unc.(rel) Integration Tgt 78.00 *** AUTO *** Lvl ID Amt (ppbv) Response 108.000 15947214 Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv Curve Fit: Avg. RF 11) Carbon Tetrachloride (002)

Wed Mar 27 10:43:29 1991

Page: 6

Method: TO14L.M

```
Ret. Time 12.53 min., Extract & Integrate from 12.28 to 12.90 min.
Signal Rel Resp. Pct. Unc. (rel) Integration
                                *** AUTO ***
Tgt 117.00
1 119.00 99.40 20.0
                                *** AUTO ***
Lvl ID Amt (ppbv) Response
      100.000 17118746
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
                                  (*ISTD002)
12) 1,4-Difluorobenzene
Ret. Time 12.74 min., Extract & Integrate from 12.53 to 13.60 min.
         Rel Resp. Pct. Unc.(rel) Integration *** AUTO ***
Signal
Tgt 114.00
Lvl ID Amt (ppbv) Response
       10.000 97113510
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
( 002)
13) Trichloroethene
Tet. Time 13.23 min., Extract & Integrate from 12.98 to 14.00 min.
         Rel Resp. Pct. Unc.(rel) Integration *** AUTO ***
ignal
Tgt 130.00
Q1 132.00 97.50 20.0
                                 *** AUTO ***
Lvl ID Amt (ppbv) Response
1
       96.000 10250028
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
14) Toluene
                                    ( 002)
Ret. Time 14.57 min., Extract & Integrate from 14.32 to 15.25 min.
      Rel Resp. Pct. Unc. (rel) Integration
Signal
Tgt 92.00
                                 *** AUTO ***
                                 *** AUTO ***
Q1 91.00 177.20 20.0
Lvl ID Amt (ppbv) Response
       98.000 15491979
Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv
Curve Fit: Avg. RF
```

5) Tetrachloroethene

Method: T014L.M Wed Mar 27 10:43:29 1991

(002)

Ret. Time 15.44 min., Extract & Integrate from 15.19 to 16.00 min.

 Signal
 Rel Resp.
 Pct. Unc.(rel)
 Integration

 Tgt 164.00
 *** AUTO ***

 Q1 166.00
 132.30
 20.0
 *** AUTO ***

Lvl ID Amt (ppbv) Response 1 106.000 12874108

Qualifier Peak Analysis ON ISTD amount: 10.000 ppbv

Curve Fit: Avg. RF

END OF DATA ANALYSIS PARAMETERS

Method: T014L.M Wed Mar 27 10:43:29 1991 Page: 8

3.0 QUALITY ASSURANCE

3.1 Description of CSL QA/QC Program

The QA/QC reports for the analytical data reported in the previous section are presented here by method and by day the individual samples were analyzed. The standard QC checks used by the CSL are described below. In addition to the standard QC checks performed daily on sample batches, the project had included initial performance evaluation criteria, including an initial calibration curve, and seven replicate samples analyzed at 10 to 50 ppbv. The results of the initial performance evaluation are given in Part 3.3.

GC/MS TUNE (GC/MS ONLY)

The GC/MS tune is checked each day with BFB according to the procedures described for Volatile Organic Compounds in EPA Method TO-14 and Method 8240. On the days samples were analyzed the tune criteria was met for all compounds.

INTERNAL STANDARD AREAS

The internal standard areas of the samples are compared against the 100% standard run that day. The accepable criteria is the response is 75% to 125%.

STANDARDIZATION

For ambient air and landfill gas samples, standardization is done using commercial NBS traceable gas standards obtained from Scott-Marrin or Scott Specialty Gases. The standard cylinder for the CSL contained all target compounds at 100 ppbv. The standards were diluted using a static dilution system on the concentrator.

CONTINUING CALIBRATION

A daily two point calibration is done on CH2M Hill 100 ppbv standard cylinder to check the initial calibration curve used to establish the method performance. The standard area of the 100% standard and 50% standard are divided by their internal standard areas to determine the RRF relative to the internal standard.

INITIAL CALIBRATION

The initial calibration data for the CSL sample analysis is included in Part 2.3. The report gives the relative response factor (RRF) which is calculated as shown below.

GC/MS by EPA Method TO-14

Calculation of RRF for benzene RRF50

QC Criteria for Project

The QA criteria for the CSL for this project was defined in Section 7.10.1 of the Quality Assurance Project Plan (QAPP) for McClellan AFB prepared by CH2M Hill. The Criteria is listed below:

Canister Blank	<0.2 ppbv
Instrument Blank, Daliy	<0.2 ppbv
	<30%
	<50%
Performance Evaluation Sample	<50%

If the above criteria is not met corrective action will be taken as outlined on the following page.

3.2 Project QA/QC Summary

The overall quality of the analytical data generated by the Close Support Laboratory was excellent. All of the initial performance evaluation guidelines specified in the project plan were met before the start of sample analysis. The results for these tests are given in Section 3.3 where they are discussed more fully.

The daily CSL project QA objectives listed in Section 3.1 were checked each day and a QA summary sheet generated. On examining the data there was a Dichloromethane instrument blank level of about 2 ppbv that appeared on April 1. The MDL values on the final report should be set to 2.0 ppbv for this compound for the project. The MDL values for other compounds should be set at 0.2 ppbv unless they appeared in the daily blank. The RPD for F-11 exceeded the objectives of 50% on a couple of days. This appears to be an integration window problem.

The sampler blanks were suppose to be analyzed at the beginning of the day after the instrument blank to avoid carryover from high level samples. On many of the days the sampler blanks were analyzed after high level samples and showed some contamination from the larger concentration compounds. Carry-over of about 0.01 to o.1% could be expected.

A evaluation of the QC checks for each day are given below (See Section 3.5 for actual sheets):

3/27/91: The BFB tune passed and in the instrument zero air blank all target compounds were below 0.2 ppbv, and the relative percent deviation of the duplicates were less then 50% for all compounds over 1 ppbv.

4/1/91: The BFB tune passed and in the instrument zero air blank all target compounds were below 0.2 ppbv except of Dichloromethane which appears to be at a constant level of about 2 ppbv throughout the project, even when the system was thoroughly flushed. The relative percent deviation of the duplicates were less then 50% for all compounds over 1 ppbv except for F-11 which was 200%.

4/2/91: The BFB tune passed and in the instrument zero air blank all target compounds were below 0.2 ppbv except for ppbv, 2.7 which was Methylene Chloride DCE which was 0.3 ppbv and F-113 which was 0.4 ppbv. These compounds were present in high concentrations in the landfill gas samples and were significantly above the levels found in the blank, so the data was not effected by the presence of these compounds which were the result of carry-The relative percent over and were difficult to clean out. deviation of the duplicates was geater then 50% for all compounds measured. A reason for the large deviation for this day is under investigation. This was not a porblem on other days.

4/3/91: The BFB tune passed and in the instrument zero air blank all target compounds were below 0.2 ppbv except for Methylene Chloride which was 3.89 ppbv, 1,1-DCE which was 1.4 ppbv, F-113 which was 0.8 ppbv, and TCE was 0.4 ppbv. These compounds were present in high concentrations in the landfill gas samples and were significantly above the levels found in the blank, so the data was not effected by the presence of these compounds which were the result of carry-over and were difficult to clean out. The relative percent deviation of the duplicates were less then 50% for all compounds over 1 ppbv.

4/4/91: The BFB tune passed and in the instrument zero air blank all target compounds were below 0.2 ppbv except for Methylene Chloride which was 1.9 ppbv, 1,1-DCE which was 0.4 ppbv. These compounds were present in high concentrations in the landfill gas samples and were significantly above the levels found in the blank, so the data was not effected by the presence of these compounds which were the result of carry-over and were difficult to clean out. The relative percent deviation of the duplicates were less then 50% for all compounds over 1 ppbv except for F-11 shich was 67%.

4/5/91: The BFB tune passed and in the instrument zero air blank all target compounds were below 0.2 ppbv except for Methylene Chloride which was 1.9 ppbv, 1,1-DCE which was 0.4 ppbv. These compounds were present in high concentrations in the landfill gas samples and were significantly above the levels found in the blank, so the data was not effected by the presence of these compounds which were the result of carry-over and were difficult to clean out. The relative percent deviation of the duplicates were less then 50% for all compounds over 1 ppbv.

4/8/91: The BFB tune passed and in the instrument zero air blank all target compounds were below 0.2 ppbv except for Methylene Chloride which was 1.9 ppbv. The relative percent deviation of the duplicates were less then 50% for all compounds over 1 ppbv.

4/9/91: The BFB tune passed except for ion 176 which was 102% instead of 101%. In the instrument zero air blank all target compounds were below 0.2 ppbv except for F-11 which was 0.8 ppbv and t-1,2-DCE which was 0.3 ppbv. These levels were not high enough to present a problem with the data. The MDL for these compounds should be set at the blank level for that day. The relative percent deviation of the duplicates were less then 50% for all compounds over 1 ppbv except for F-11 which was 88%.

4/12/91: The EPA BFB tune criteria was slightly off on ions 173, 175, and 176 for this day. No actual criteria was specified for the project and the tune criteria only effects

mass spectral library matches, which were not done on this project. Since all target compounds were calibrated against a standard for that compound, there would be no effect on the quantitative results. The bank was less then 0.2 ppbv except for 1,1-DCE which was 0.6 ppbv, F-113 which was 1.8 ppbv, t-1,2-DCE which was 0.3 and TCE was 0.4 ppbv. These levels were not significant except for F-113 which is present in high concentrations in the landfill gas samples and is significantly above the levels found in the blank, so the data was not effected by the presence of these compounds. The RPS was less then 50% for all compounds.

3.3 Initial Performance Evaluation

For the initial performance evaluation of the Close Support Laboratory (CCL) the following measurments were made:

- 1) Instrument Blank and BFB Tune
- 2) Three Point Initial Calibration
- 3) Seven Replicate Measurments at 10-50 ppbv

The results for these measurments are given in the following Sections.

3.3.1 Blank Canister

VOLATILE ORGANIC COMPOUND REPORT

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	ZERO AIR
Operator	HOYT	Lab #:	B03281B1.D
Volume	200 ml	Date Ana	03/28/91

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
1,1-Dichloroethane	0.75	0.0
1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.0
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Environmental Analytical Service 170 Granada, Suite C San Luis Obispo, CA 93401 3.3.2 Initial Calibration Curve

INITIAL CALIBRATION DATA Close Support Laboratory, McClellan AFB

EPA Method TO-14: GC/MSD Full Scan

Lab File:

RRF50 = S03271A2 RRF100 = S03271A1 RRF200 = S03271A3

	RRF50	RRF100	RRF200	AVERAGE	%RSD	QC Limits
	10	20	50	RRF		
Freon 12	1.47	1.41	1.56	1.48	4.2	30
Vinyl Chloride	0.49	0.42	0.48	0.46	6.3	30
Freon 11	0.00	0.00	0.00	0.00	ERR	30
1,1-Dichloroethene	0.00	0.00	0.00	0.00	ERR	30
Dichloromethane	0.00	0.00	0.00	0.00	ERR	30
Trichlorotriflouroethane	0.00	0.00	0.00	0.00	ERR	30
1.1-Dichloroethane	1.32	1.45	1.40	1.39	4.1	30
Total 1,2-Dichloroethene	0.57	0.56	0.70	0.61	10.1	30
Chloroform	1.53	1.51	1.72	1.59	5.8	39
1,1,1-Trichloroethane	1.39	1.36	1.59	1.45	7.3	30
1,2-Dichloroethane (ion 62)	1.36	1.33	1.54	1.41	6.7	30
Benzene	1.96	1.92	2.19	2.03	5.9	30
Carbon Tetrachloride	1.67	1.58	1.91	1.72	8.1	30
Trichloroethene	1.01	0.98	1.19	1.06	8.7	30
Toluene	3.06	2.95	3.37	3.13	5.6	30
Tetrachloroethene	1.28	1.24	1.42	1.31	6.0	30

RRF = Relative Response Factor = Std Area/IS area

3.3.3 Seven Spike Samples



Spiked Canister / Performed at on-site Mobile Laboratory Volatile Organic Spike Recovery Summary Sheet

Date: 3-28-91

Concer Compound	Run l ppbv	Run 2 ppbv	Run 3 ppbv	Run 4 ppbv	Run 5 ppbv	Run 6 ppbv	Run 7 ppbv	% RSD
Freon 12	15.4	16.9	15.2	15.0	14.6	17.2	11.5	11.4
Vinvl Chloride	15.8	18.2	15.7	14.9	14.9	18.4	12.2	12.5
Freon 11	13.8	15.7	13.7	13.6	13.6	15.6	10.5	11.6
1.1-Dichloroethene	14.2	15.8	14.0	14.3	14.5	16.2	10.4	12.3
F-113	14.1	15.8	13.7	13.4	12.2	15.9	9.4	15.4
Dichloromethane	14.7	16.2	14.9	14.5	14.3	16.5	11.2	11.0
1.1-Dichloroethane	14.1	15.4	12.5	13.4	13.5	15.6	10.4	12.1
1,2-Dichloroethene	15.2	16.6	14.9	15.7	15.2	16.7	14.0	5.6
Chloroform	14.8	16.4	15.2	14.6	14.2	17.0	11.1	11.9
1.1.1-Trichloroethane	15.5	16.9	15.2	15.5	15.8	16.9	14.2	
1,2-Dichloroethene	14.5	15.9	13.7	13.8	13.8	14.9	12.0	
Benzene	16.0	17.4	15.3	15.7	15.5	16.8	14.0	6.3
Carbon Tetrachloride	16.6	17.9	16.0	16.1	16.3	17.5	14.7	5.9
Trichloroethene	15.0	16.2	14.4	14.7	14.8	16.1	13.7	5.5
Toluene	10.5	11.8	10.6	10.6	10.7	11.3	9.6	5.7
Tetrachloroethane	16.3	17.7	15.7	16.1	16.2	17.6	14.7	6.0

VOLATILE ORGANIC COMPOUND ANALYSIS REPORT Close Support Laboratory, McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Site: 1.0 ppbv Test Sample

Can #:

Date Sampled:

Lab #:

Date Analyzed: 3-27-91

Compound	MDL ppbv	С	oncentration ppbv	Concer	ntratio ug/m	-
Freon 12	0.75	0.53	nd	2.63	nd	•••••
Vinyl Chloride	0.75	0.72	nd	1.84	nd	
Freon 11	0.75	ERR	nd	ERR	nd	
1,1-Dichloroethene	0.75	ERR	NM	ERR	NM	NM
Dichloromethane	0.75	ERR	NM	ERR	NM	NM
Trichlorotrifluoroethane	0.75	ERR	NM	ERR	NM	NM
.1-Dichloroethane	0.75	0.72	nd	2.91	nd	
c-1,2-Dichloroethene	0.75	0.60	nd	2.38	nd	
t-1,2-Dichloroethene	0.75	0.74	nd	2.95	nd	
Chloroform	0.75	0.60	nd	2.94	nd	
1,1,1-Trichloroethane	0.75	0.58	nd	3.18	nd	
1,2-Dichloroethane	0.75	1.29	nd	5.23	nd	
Benzene	0.75	0.89	nd	2.84	nd	
Carbon Tetrachloride	0.75	0.47	nd	2.99	nd	
Trichloroethene	0.75	0.68	nd	3.66	nd	
Toluene	0.75	1.99	nd	7.52	nd	
Tetrachloroethene	0.75	0.67	nd	4.53	nd	

Data Flags:

B - Compound Present in Daily Blank NM - Not Measured on this Analysis

3.4 GC/MS Instrument Log Sheets

Analyst (s)	Viener	tere Hyt Date	3/15/71				
Instrument HP	GC/MSD	Method	T014.M				
		1 a+ 2.0 ml/sa					
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File Name	Can No.	Description	Sample Size	QP	S	P	D
50315195	.0	STBIETS OF	2.0ml				
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Analyst (s) V (orgae	reDate3	118/91				
Instrument HP G	C/MSD	Method TO	14.m				
Comments IS	loaded	Lat 2.0ml/sample			•		
File Name	Can No.	Description	Sample Size	QP	S	P	D
5031B1A1.0		570 EAS -08	ln o.e	1			_
50318182.D		TO KAS -08	1	1			
B03181A1.10		Zeroair Blank	200ml	_			
BOSIBIAZ-D		7000 an Black	zooml	سي			
80318183.0		Blank Zero are	Looml				
203181A1.0		& Aucht Smpl	some				
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•	GC/MSD SAMPLE LOG		
Analyst (s) V Lange	Date3	19/91.	
	MethodTc		
Comments 100	ded at 2.0 ml/s	ample	
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File Name Can No.	Description	Sample Size QP S P	<u> </u>
503191A1.D	500 EAS 08	2.0ml	
503191AZ D	500 BAS-08	1.0ml /	
50319193·D	570 KAS-09	4.0ml	·
50319184.0	STD 645-08	1.onl	
50319145.0	STD 645-08	2.0ml	رب دربا
503 FIAL. D	STO EAS-08	1.one	
50319197.0	' STO EAS - 09	4.0 ml	
S0319188.D	STO EAS-OR	2.0 ml	
50319199.0	STD EAS-08	1.0ml	
B03191A0.0	Blank Zero ar	200ne	
50319 190.D	STN EAS-08	1.0 ml	
203191HI.D	STO EAS-08	1.0ml	
Q03191AZD	STO EAS-03	1.0ml	
Q03191 A3.0	STO EAS - US	a-onl v	
Q03191A4.0	STD BAS. OB	4.0ml V	
00319185.0	510 1516-09	4.0ml	
0.39191600	3TD 1285-03	lone	

		GC/MSD SAMPLE LOG					
nalyst (s) V(ongeen	Date3/3	10/91				
Instrument HP GC	/MSD	Method TOI	4.m				
Comments IS	loaded	at 2.0 ml/samp					
File Name	Can No.	Description	Sample Size	QP	S	P)
B0320191.0		BIANK WIS 2.0mg	2) 200 ml	-	_	\bot	
803201 AZ.D		Blank w/ IS 10. ml 17	الم صد ا				
503201AL.D		3HD ETAS - 08		!!			
50320182.0		STD EAS -08	2.0mg				
503201 A3.0		STO EAS - 08	4.onl				
50320194.0		540 EAS-08	1.0ml	<u></u>			
50320195.0		· STO EAS-08	10ml	اسايا			_ 4
503201A6.0		STOWNSON	4.0 ml			_	
503201AT.0		5TD MAS-08	2.onl				
503201AB.D		STO EAS-OB	10.0ml	س			
503201 A9. D		570 EAS-09	10. ml	1 1			
50320100.0		STO 645 - 08	2.one				
003201 A.D		সাত ধা ন ঙ-তাহি	10.0ml	2/			
003201 AZO		STO EAS-OB	2.0ml				
0032018.0		500 was -08	Goonl				
Q03201 A4D		Hill Stat	20ml				
803201ALO		Blank	200ml	-			
B03201AZ.D		Blank \$	200 ml	/			
B0320143.0	AVILL	Blank smpl	Looml	/			
603201A4.D		Blank No Drain	200 mL	/			
\$0320 145.D		Blank smplinlet	250ml	/			
3000 ALD	P-10	MW-AC-C-019	aponl				

cont.

Analyst (s)	Viengenacy	Date	3/20/91	cont)	
Instrument HP G	C/MSD	Method T	014.m		
		aded at 2.0 ml			
					15 15 1
File Name	Can No.	Description	Sample Size	QP S	PD
3001 ALD	P-1	mw-AC-C-001	20.0ml	/	
3001030	7-1-	140- HC-C-001	100 ml		A BOY
3002AZI. D V	P-2	MW-AC-C-002	20.0 ml		
3005 ALD	P-5	nw-AC-C-007	20.0ml		
- 300ZAZ.D	P-2	MW-AL-C-002	20.0ml		
3007 AZ 0		mw-AC-(-013	20. onl		
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		Method					
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ile Name	Can No.	Description	Sample Size	QP	S	P	D
50321(A) .D		STD EAS-08	2.0ml				
503211A20		STO EAS-OB	1 _				
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Analyst (s) 5+c	ine ItayT	Date3 2	5/91.		······································		
Instrument HP G	C/MSD	Method TO14					
Comments							
File Name	Can No.	Description	Sample Size	QP	S	P	D
503751ALD		STAMMED (copplex + 15	2 MI 15				
503251 AZ. D		Standard 100 pplou + 15	2 M LS 20 M STD 40/5 200 M				
903251 ALO			200ml			\vdash	:
603251 BI.D	4	l e e e e e e e e e e e e e e e e e e e	200 ML	-1			
Changed	Time File	Levo aid Blant	5-20Dans, 1	Chan	صد	10	m le
B03Z51k2, D			24LLS			H	
B0325143.0		Zno air Blank	2 ML 2 ML	Aztra	al	bel	-12.
\$0325 IAB. D		100 pph 500	2011				
3007A2.D		MW-AC-C-202	2000L				
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Instrument HP G	C/MSD	Method	10141				
Comments							
File Name	Can No.	Description	Sample Size	QP	S	P	D
503261A1.D		100 YDBV STD 1200	200 ml 15				
503261 AZ,D		100 Puby Sto	ZIVALIS				
	an ozt	1 2/s = 5 A	at Air to 4.	-i			;
503261A31D	Į.	100 pplay STO	20mL				
3007 N.D		Room Hir - Blank	2:0 mc 15				
same	live not	dennected to value - 1	reconverted w	411	115	a	
3007B2D		MW-AC-C-013	2.000			<u> </u>	1
3003AZ. D		MW-AC-C-00-	3 ZUNL W	<u> </u>	<u> </u>	_	
3004 ALD		MW-AC-C-OC	8 2006 LS			igspace	
3017 Al.D	15	MW-DR-C-3-	2 ZOOML	700		<u> </u>	
3016 ALD	P-20	MW-DR-C-3-	ZIONL 700ml	498	_		
3016 AZ, N		Puplicale	2.0 ml 200 ml	975			
3006 A1,D		MW-AC-C-009	200 mL 200 mL				
3009 AL.D		MW-AC-C-015	2.0 mL				H k
3008 A1. D		MW-AC-C-014	2.0 ml				H lo
3012A1.D		MW-DR-1-3	2.0 ml	705 986			
3013A1.D		MW-DR-C-2-1	2.0 ml	718			
3010A1.D		MW-DR-C-1-1	2.0 ml	499			
3014 A1.D		MW-DR-C-2-2	2.0 ml	716			
B03261A1.D		Zero Air Blank	2.0 ml				
301BAI.D		MW-DR-C-3-3	2.0 ml 200 ml	963			L
3015ALD		MW-DR-C-2-3	2.0 ml	716			

Sile Name Can SONALD P-	No. Description 2.3 MW-DR-	 	Sample Size Z.O mi ZOO mi	QF GA8 PS7	S	P
	23 MW-DR-	-1-2				
	•					
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Analyst (s)	•	Date	•		<u> </u>		
Instrument HP G	C/MSD	Method TOIL	<u> </u>				
Comments	·		<u>-i</u>				 -
					_	 -	
File Name	Can No.	Description	Sample Size	QP	S	P	D
503271ALD		100 pplex Standard	2000 ML				
503271 AZID		100 pphy 500	2.0ml 15 10.0ml				
503271 A310		100 ppho STO	ZONIS				
503271 A4.D		100 polou 500	20M1 15				
503271A511		100 pplus STA	7.046 15 20.046				
B03271 Al. N		Eon air	2.0 ML 15				
3019 AL D		MW-PC-C-2-B	2000 L	X			
3020 AL. D	0-21	MW-PC-C-Z-1	2041 13	*			
3020 NZ D	11-21	Mw-PC-Z-2-1 Dra	201115				
3020 K3.D	P-21	MW-PC-C-Z-1 Du	20011				
3023A1.D	P-11	MW-PC-C-2-3	2.0 ml IS				
3021A1.D	P-18	MW-FC-C-2-2	2.0 ml TS 200 ml S			T	
3022 AI.D	1-17	MW-PC-C-Z-Z Dup.	2.0 ml IS 200 ml S				
3022A2.D	F-17	MW PC-C-7-2 DUD	00 1 70				
					T	T	
						T	

Analyst (s) Store	J	Date					
Comments							
File Name	Gen No. MCTHOD	Description	Sample Size	QP	S	P	D
53281 ALD	1014 L	100 pphs 550	2.04L IS 204L				
803281B1.D							
203281BI.D		Spike Canister, 15ppl	ZIONLS 1V200ML				
00328182.D	T014						
003281B3.D	T014						
Q03281B4.D	TO14						
Q03781B5.D	T014						
Q03281B6.D	TOH						
503281B1.D	1014	LODPADU STD	ZONL			<u> </u>	<u> </u>
						<u> </u>	<u> </u>
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inalyst (s) 5+	212 Ho	Date 3	129/91.			-	
Instrument HP G	C/MSD	Method	TOIYL				
Comments							
						1	
File Name	Can No.	Description	Sample Size	QP	S	P	D
503291 11.0		Standard 100 pphy	20 m (1) 20.0 m L 20 m L 1s				
B03291 BLD		Zero ar	200 ML				
5027 @							
53027AI.D		MW-AC-C-3-B	2.0 IS 200 ml s				
53024AV.D		MW-AC-C-3-1	2.0 ml				
53025ND	P35	MW-AC-C-3-2	2.0 ml IS 200 ml smp				
53026AL	1240	·MW-AC-C-3-3	200 ml smp 2.0 ml Isl 2.00 ml Sma	705			
53028AI.D	P34	MW-HDR-C-1-1	2.00 ml Smo 2.0 ml IS 200 ml Smo				
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Analyst (s) Fa	Rith/1	2 a fill & Date Oi	APRIL: 199				
Instrument HP G	C/MSD	Method014	L 3 TO14				
Comments							
			_			_	
File Name	Can No.	Description	Sample Size	QP	S	P	
90401 BL 6		STANDARD 100PPBV	2.000				
30401182. D			2.00 5			一	
		STANDARD 100 PPRV	20 7 11 1				
BO11 - B1.0		ZERO AIR BLANK	200 mil			-	
Enar AI.D		ZERO AIR BLANK	Z COM			\vdash	
* 3037A1.D	1	MW-DR-C-9-3	21000 mC	681		\vdash	
3030 AI D	P-30	WM-CK-C-2-5	2. 0n:125	982			
3030A2.D	P-30	MW-DR-C-72	1.0.0	NET.	17.15	701	<u>يٰد</u>
303031.D	P-30	MW-DR-C-7-2	20m1 25 100m C		100	-01	4.
203082.0	P-30	MW-DR-C-7-2 (OUP)	10.0 no	MET	4 615	70	191
		- USED FOR SAMPLE CAU AFTER CUSTOM REPORT					
		CHANGES.					-
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LAST THE STATE ACTION THROUGH TO INTERCENT OF THE STATE O

ile Name	Can No.	Description	Sample Size	QP	S	P	D
S0902/B1.D		STANDARD 100 PPBV	20 000 IS				
804521-		ZERO AIR	2.011.55				
B0402122.		ZERO AIR	200 ml				
60402163		ZERO AIR	20 m/2				
3035 BI. D	P-28	100-0R-C-9-1	7.0-1 ES 200-1				
7036 BI.D	6. 3	NO. OR-C-9-2	100 ml	140 m	e s	~	e 5
9.14P50E	P-29	100-6R-C-7-1	2.0-1.15	Flow] "		
3031 A1.0	P -44	1101-UR-C-7-3	7.0-1 23	F14-	·		(F
9.1A PEOE	1-43	mw-DR-C-8-3	7.0-\ IS	FS			
3033 ALC	P-49	10-04-C-8-Z	137-1	FS	G340		
3032 ALP	F 45	11 8 - CR C - R - 1	7.0-1 IS				
3032A9.L 13 3039A1.D	P - 27	100-14 C-C-7-2 100-1-15 MH-DRC-7-2	2.0-1 IS	£ 7.0	150		
303881	+-42	1 11 11 11 11 11 11 11 11 11 11 11 11 1	3.0-1	1010			
3038 Fil. 1-	P-42	Carlo Carlo Garage	2.0-1				
3040A14	6-32	m 12-11/2 - 7-3	2.0m/IS 158.5				
3041 A1 U	, 13	90-60 C 1-6	134 -1				
	<u> </u>			<u> </u>		_	<u> </u>
						-	_
						_	<u> </u>

Analyst (s) ED RITH DAVI TILLER	Date 03 APRIL: 1991
Instrument HP GC/MSD	Method
Comments	·

*

ile Name	Can No.	Description	Sample Size	QP	S	P	D
504021810		100	22.1-0.5				
<u>50403181.D</u>		IN A LOOPERV	Z.omt IS				
50403182.0		1.71 1. 16 1. 100 11-12 V	20 Cm (<u> </u>
B04031B1.D		2150 AW 85408	200 pm (
B040314/		1	2.0m1 IS	AFTE	RH		
3042A1.D	1-47	1:41-21-6-1	2.0m(IS 200m(
3043A1. L	1-46	10 pt 11 C 6-2	2.0 ml 25				
3048111.5	12 =1	N.W-11C-C-8-3	2.0 ml ES 200 ml	UNI	ABLE N F	7	P E
3048 42 :	131	1 W-AC-C-8-3	2.0ml ES 95 ml		PEM	7	
3044A1.2	1-62	N W. DU. C-6-3	7.0-1 IS 200-1		1		
3045A1 D	1 41	1 11-16-6-4	2.0-115				
3047 A1 F	636	WH 4 C - C - E - 4	7.0-1 33				
3046 A1 C	1-76	100000	7 7-1 53		1		
3047 ALO	P = 1	11W-AC-C-8-12	2.0-1 IS		1		
3051A1.0	p. 35	1001-12K-C-5-Z	200-15	1032		T	
3051 AZ.L	P-55	The La Control Dug.	2.0-1 \$5	1035	1	1	
3052A1.C	1000	p. w - 1011 - C - 2 - 3	Z.0-1 I3	 	+	†	T
3050 A1.0	p. 54	DR-C-5-1	30-1 I)	 	+-	+	+-
		114- AC-C-007	2.0-175	-	+	+	+
3006 KI.i:	D-€		2/.6	┼	+	+	┼─
さりちょす	r	MW-4C-C-008	21.6				
3011 61 0	4-23	1744-0R-1-2	20-123	457	ms	m	رجد- ا
		FILAMENT 2(B) OPEN					

Analyst (s) RUTH /VII.	Date 34 APR16 1991
Instrument HP GC/MSD	Method T014/70142
Comments REFLACE (1 F.	PEFOIL PLUMINE STATEMENTES

ile Name	Can No.	Description	Sample Size	QP	S	P	D
<u> </u>			2.0 m/ ES				
<u>504041 B1.1</u>		STANGHAL LOOPEBY	20.0 1				
600000000		100000000000000000000000000000000000000	2.00125	}	ł	ł	
504041BZ.D		SOME ALE TOO PERV	20.00				
B04041B1.6		ZE AL BLANK	2.0m(IS 200 m L				
3011B1.D	6-53	100 W - DR-1-Z	2.0-1 TS	4237			
_	15	110 - DR - C-2-2	2.0-1 ES	716			
3014810	r.17	1.0 - 0.1	21.6_1	953			
3053A10	P.58	110-r-c-c-9-1	2.0-1 IS	1027			
3053 AZ.L	P-52	. mw-AC-C-7-1 Dup	2.0~\Z\$				
302361C	P = 5	1000 AC-C-9-1	20-115		-		- 1
3054 A1.0	P-57	May - AC- C- 7- Z	S 0-1 IZ				_
3056H1 1	P-63	MW-AC-C-9-4	7 0-150			-	-
303 4.11	7-63	MW CHECO CO TO T	200~1	<u> </u>		<u> </u>	
3055 A10	P-64	176-60 1-7-2	2.0~\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	ļ			
3057 AI L	F-65	pruse C. T.	\$ 20-123				
302181.1	P-13	WW.1-(-(-Z-Z	20-1 ES			 	
3001			21.6-1	 	-	 	├-
3025B1.0	P-35	1000 - 60 - 5 - 5	2.0-1 IS	alo-	i c	h-	3 60
3025111	P 35	MW-AC-C-3-2	2.0-1.ZZ			T	Ť
302-		MW-NB-03	216				
3039 BIC	1-27	1000 AC-C-7-2	2.0-1 25				
3030 61 0	P- 25	100 10 to 200 2	2.0-135	Yce1 3010	640 83	400	-
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Analyst (s) XII							
Instrument HP G	C/MSD	Method TC1	4/1013	<u> </u>			
Comments							
File Name	Can No.	Description	Sample Size	QP	S	P	D
S04051B1.D		Comment ICE FEY	2.0ml IS 24.0 ml				
50405182.1	1	STANDAL 100 (1284	2.0 ml IS 20.0 ml				
B04051B1.T	1	ZEEN AIR BLAN	2.0ml IS 200 m f				
3059 AI.D		1111-LR-6-1-2	2.0ml IS 200 ml {				
· 3058A1.T		M.W-LK-C-4-1	2.0=115	KIIN			
3058.112.		10 W - DR - C- 4-1	2.0m(IS				
30 60 A 1. T			2.0m1 IS 200 ml				
3064A1.D	P 71	VR-AC-C-31-B	20m1 IS 200m1				
3061A1.1	11-12	VI110 C- 31-1	200 p. 5				
3062A1.D	P-69.	VR-AC-C-31-Z	2.00-1 LS				
3063 A I.P	r-68	VR - HC - C- 31 - 3	2.00-1 FS 95-1	1050			
7063 AZ V	P. 65	VM-110-C-3116	2.00-1 IS				
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nstrument HP (C/MSD	Method To	14 / FOI	4 (
omments 4002	6: · k	FARMENT	OPEN (13.7 m	in in	307°	<u> 281.</u>	(د.
ile Name	Can No.	Description	Sample Size	QP	S	P	D
304081B1.D		DAILY STANDARD 1007PBY	2.0ml =5 20.0 ml				
304081B1.D		ZERO AIR BLANK	2.0ml IS 200 mL				
3065 A1. D	P-61	MW-AC-C-6-1	2.0m1 IS 200 m l				
3068 A1. D	P. 67	MW-AC-C-6-B	2.00ml				<u> </u>
3066 A1. D	P-62	MW-AC-C-6-2	2.0 m/ II				
3070 A1.0	P-73	mw- AC-C - 5-1	2.0-1 23	237	44		
3070 A 2.0		. D-0	200-1				L
3071 A1.0	p.76	MW-AC-C-5-Z	2.0-133 200 m				
3072 A1.0	P-70	MW-AC-C-5-3	2.0m\ Z3				_
3077 BI.D	P-70	mw-AC-C-5-3	20 ml			-	<u> </u>
	<u> </u>	FILAMINT OPEN		ļ	-	-	 -
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Analyst (s) RUTH / MILLER	Date // APRIL 1991
Instrument HP GC/MSD	Method 7014 / 7014 L
Comments FILAMENTS (1) \$ (3) R.	EPLACID

ile Name	Can No.	Description	Sample Size	QP	S	P	D
504111B1.D		DAILY STANDARD 1001134	2.0ml ES 20 ml				
SU4111B2.D		DAILY STANDARD 100 MBY	2.0ml ES 20.0 ml 2.0ml IS				
B04111 B1.D		ZEROAIR BLANK	200 ml				
3067A1.D	P-66	MW-1C-C-6-3	2.0m IS 104 ml		8		
3069A1.D	P-81	M W-AC-C-5-B	2.0.d IS 200 m l	CA O	WIST 15	BR	
3075ALD	P-91	MW-1C-C-4-3	2.0mlEs				L
3077 A1.D	P-74	MW-HDR-C-1-2	2.0 ml 200 ml				
3078 A1.D	P-46	MW-HDR-C-1-3	2.0-155				
3079A1.D	12-75	MW-HDR-C-1-4	2.0-113	1064			
3079AZ U	1.75	140-4124-C-1-4 Day	20-1 E)				
3079131.0	P-73	,~ - HUR-C-1-4	2.0~1 S3				
3074 AI. D	P-77	100 - 14C. C-4-Z	Z.0-1 D	1	/		•
3073A1.D	p-82	mw-Ac-C-4-1	110 2.0-12	ı	/	1	•
3088ALD	12.85	VR-AC-C-44-3	2.0-153		/		•
3083A1.0	12-48	VR-AC-43-4	2.0-1		V	7	•
30 42 A1.D	٧- ٥ ٪	VK-AC 43-3	2.0-1 I'		L	7	
3081 8 C	1 93	VR-AC-43-2	7.0-115				
3080B1.P	P-87	1R-AC-43-1	2.0-125 1 59				
3076AI.D	10-80	MW-AC-C-4-B	20-13			T	
3091 AL.F	P-89	MW.HOR-C-7-1	128-1		-	1	•
3090AID	P-97	mw-HDR - C-1-6	2.0-153		1	不	•
3070 BI.D	P-97	MW-HDR-C-1-6	21.6		1	才	1

Analyst (s)_	Ruth/miller	Date 4/18-12/9	
	HP GC/MSD	Method	
Comments	4 mhal Co.		

ile Name	Can No.	Description	Sample Size	QP	S	P	D
3085 AI.D	P-80	VR-AC-C-44-1	2-1 [5	·	V		•
3089 AI.P	P-92	mw-HOR-C-1-5	2-153				•
3084 81.0	P-78	VR-AC-C-44-B	2 TS 200-1				
308671.0	12-84	VR-AC-C-44-Z	2-155		1		1.
3087B1.0	P-83	VR-AC-C-43-B	Z-1 [3 		V	1	•
3103 A1.P	P-118	VR-AC-C-34-Z	2-1 25		~	1	-
3102 M.O	P-124	. VR - AC - C - 34 -1	Z-' I'S		1	1	T
3101 Ag1. D	P-122	UR-AC-C-34-B	250		/	F	1
3104 810	P-123	VR-AC-C-34-3	2-123				T
3119810	P-114	VR-AC-C-39-3	2-153				T
3110 AL C	P-109	VR-AC-C-35-1	2-153		V	1	
3/11 A1.D	P-113	VR-PC-C-35-5	2-15				
310981.0	P-112	VR-PC-C-35-4	2-1 13				
3112 ALD	P-104	VR-AC-C-35-Z	2-153				\top
3113 A1.0	P-10 8	VR - AC-C-35-3	2-1 [3				T
3108610	P-103	VR- AC-C-35-B	2-1 53				
3106 ALD	P-94	MW-HOR-C-9-1	Z-1 IS 200:-1		V	才	\top
3115 ALD	P-102	mw-HDR-C-7-4	2-1 13		1	1	
3105 AL.D	P-121	ww- HDR - C-7-2	2-123		V		
				-			
						1	T
						7	1

I	nstrument HP GC	MSD '	Method To	P14 / 40141			
С	omments TS	oaded	at 2.0ml/sam	•		 -	
_		BFB	Tune	1	T		- 1
F	ile Name	Can No.	Description	Sample Size	QP	S	PD
L	SOYIZIAI.D		100 ppby 54d	20 me			
_	504121AZ.D		100 ppbv Sta	20 me			
L	SOUIZIA3.0		100 ppby S+d	20ml			
L		- le	: Auto tune				
L	SOUZIBI.D		100 ppb v 5+d	20 ml			
ŀ	5041Z1B2-0		100 gobu Stal	20 me			10
	30412183.D		· 100 ppbs 3td	some	1		
ļ	B0412181.D		Blank	200m			
L	3098BI. D	Pine	VR-AC-C-61-B	200 ml		<u> </u>	
L	3120B1.D	P105	YR-AC- C-39-B	200 me			
	3105A1.P	PIZI	mw-HOR-7-2	2 m 1 IS 159 m 1			
	3123 A1.0	P120	VR-AC-C-36-Z	24133			
	3127A1.0	P-115	MW-HDR-C-9-4	200-1			
	3116 AL.O	P-127	MW-HOR-C-9-3	190-1			
	3114 ALD	P 107	MW-HOR-C-7-3	103-1			
	3122 ALO	P 110	VR. A C-C-36-1	20-1	(1)		
	3107 81.0	p-117	mw-HDR-C-9-Z	200-1			
	3124 ALO	12-145	UR-AC-C-36-3	220	1095		
	3124 AZ 0	P-145	0-6	200			
	3099AL0	P- (11	VR-AC-C-61-1	200			
	3126 A1.0	P-125	vR-PC-C-36-5	200			
	3117A1.P	P-128	UR-AC-C-39-1	Soo			

alyst (s)/	M.ller	Date					
strument HP	GC/MSD	Method					
mments							
			10-1-0:			_	<u> </u>
le Name	Can No.	Description	Sample Size	QP	S	P	D
3118A1.0	P-126	VR-AC-C-39-Z	200 ml				L
3096	P-79	VR-AC C-4					
3092	P-116	UR-AC-C-61-Z	200-1				L
3095	1-99	VR-AC-C-61-4	out of di	s 4 51		-	
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Analyst (s)	HEYT	Date	4//	15/41				
Instrument HP (GC/MSD	Date	1014	+				
Comments			·					
File Name	Can No.	Description		Sample Size	QP	S	P	D
504151 AL.D		Woodhy STD		20ML 20 ML 20 ML 250ML				
B04151 ALD		100pphu STD 250 Zevo Air		LIO NI ZEOMC				
				<u> </u>				
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3.5 Daily QA/QC Reports

McClellan AFB Close Support Laboratory

EPA	Method	TO-14	GC/MS			Date:	3-27-91	
				· · • • • • •			· - · - · - · · · ·	
This	QA/QC	Report	Applies	'o the F	ollowing	Samples		
	N	CSL umber				• • • • • • • •		
		3019						

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date: 3-27-91	
Check	Typical Value	3-27-91 Value Units	-
Helium Tank Pressure	40	40 psig	
Column Pressure	20	20 psig	
Vacuum	175	175 in Hg	
Zero Air Pressure	10	10 psig	
MS Vacuum	7.2	7.2 x 10-5	
Sample Line Leak Check (2min)	5	2 in hg	

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

EPA Method TO-14 HP 5890/5971 DB-5 Capillary Co)ate: 3-27-91	e: S03271A1.D
0000,001	PA Method TO-14	5 Capillary Column

m/e	Ion Abundance Criteria	Area	% Abundance
50	15.0 to 40.0 % of mass 95	551552	23
75	30.0 to 60.0 % of mass 95	1308160	53
95	Base Peak, 100% relative abundance	2445824	100
96	5.0 to 9.0 % of mass 95	144704	6
173	Less than 2.0% of mass 174	18496	1
174	Greater than 50.% of mass 95	2242560	92
175	5.0 to 9.0% of mass 174	164800	7
176	95.0 to 101.0 % of mass 174	2194432	98
177	5.0 to 9.0 % of mass 176	141568	6

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

Standard (100%) S07270A5

Blank B07270A4 Sample Duplicate

Standard (100%) 50/2/0A	•			Duplicate	•	
Compound	Standard Area	Sample Area	Dup Area	Blank	Std Conc ppbv	
Freon 12	5340359	0	0	0	101	2.79
Vinyl Chloride	1907363	0	0	35823		3.24
Freon 11	31 64559	0	Ó	42253	101	1.32
1,1-Dichloroethene	1	0	Ó	0	108	2.10
Dichloromethane	1	0	0	0	107	3.50
Trichlorotrifluoroethane	1	0	Ó	0	105	2.07
1,1-Dichloroethane	5828055	0	Ö	Ō	109	2.30
c-1,2-Dichloroethene	2518086	Ó	Ö	34372	110	3.02
t-1,2-Dichloroethene	2997306	Ö	Ö	0	101	3.02
Chloroform	6956547	Ô	Ō	27708	103	3.12
1,1,1-Trichloroethane	6140963	Ö	Ō	0	103	4.48
1,2-Dichloroethane (62)		Ó	Ō	33879	105	4.31
Benzene	8570456	Ō	Ō	0	108	1.37
Carbon Tetrachloride	7076752	Ó	Ō	Ŏ	100	3.30
Trichloroethene	4631552	0	0	Ō	96	3.65
Toluene	12565345	Ö	Ō	43974	98	1.49
Tetrachloroethene	5513490	Ō	0	0	106	4.10
Volume (ml)	20.0	200	200	200		
BROMOCHLOROMETHANE(STD 1 DIFLUOROBENZENE (STD 1)) 3 485799 3 4536590			3592765 37231277	• • • • •	

DAILY CONTINUING CALIBRATION CHECK

Cal Date3-27-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.00	1.82	1.48	23
Vinyl Chloride	0.18	0.55	0.46	19
Freon 11	0.05	2.34	0.00	ERR
1,1-Dichloroethene	0.00	0.00	0.00	0
Dichloromethane	0.00	0.00	0.00	0
Trichlorotrifluoroethane	0.00	0.00	0.00	0
1,1-Dichloroethane	0.00	1.67	1.39	20
c-1,2-Dichloroethene	0.15	0.72	0.61	18
t-1,2-Dichloroethene	0.00	0.86	0.61	41
Chloroform	0.04	2.00	1.59	26
1,1,1-Trichloroethane	0.00	1.76	1.45	21
1,2-Dichloroethane (62)	0.06	1.70	1.41	21
Benzene	0.00	2.46	2.03	21
Carbon Tetrachloride .	0.00	2.03	1.72	18
Trichloroethene	0.00	1.33	1.06	25
To luene	0.03	3.60	3.13	15
Tetrach loroethene	0.00	1.58	1.31	21

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method TO-14 GC/MS	Date:	4-1-91	
This QA/QC Report Applies to the Follow	ing Samples		
CSL Number			
3030 3037	·		

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	4-1-91
Check	Typical Value	4-1-91 Value	Units
Helium Tank Pressure	40	40	psig
Column Pressure	20	20	psig
Vacuum	175	186	in Hg
Zero Air Pressure	10	10	psig
MS Vacuum	7.2	7.6	x 10-5
Sample Line Leak Check (2min)	5	4	in hg

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

	4-1-91 Instrument: GC/MS 01 Chod TO-14 HP 5890/5971		SO3271A1.D illary Column
m/e	Ion Abundance Criteria	Area	% Abundance
50	15.0 to 40.0 % of mass 95	484352	19
75	30.0 to 60.0 % of mass 95	1222656	49
95	Base Peak, 100% relative abundance	2492416	100
96	5.0 to 9.0 % of mass 95	165248	7
173	Less than 2.0% of mass 174	17952	1
174	Greater than 50.% of mass 95	2567680	103
175	5.0 to 9.0% of mass 174	185152	7
176	95.0 to 101.0 % of mass 174	2492416	97
177	5.0 to 9.0 % of mass 176	161664	

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

Standard (100%) Q04011B2

Blank B04011A1 Sample Duplicate

Standard (100%) QUAUTIBE	-	bupiteate				
Compound	Standard Area	Quant Ion	RT	Blank	Std Conc ppbv	
Freon 12	7424581	85	4.78	0	101	2.79
Vinyl Chloride	2379770	62	5.80	0	100	3.24
Freon 11	11126395	101	8.30	32274	101	1.32
1,1-Dichloroethene	5254762	96	9.19	0	108	2.10
Dichloromethane	3 795725	84	9.55	835248	107	3.50
Trichlorotrifluoroethane	7980601	151	9.43	66039	105	2.07
1,1-Dichloroethane	9983996	63	10.61	0	109	2.30
c-1,2-Dichloroethene	4427244	96	10.29	0	110	3.02
t-1,2-Dichloroethene	4647340	96	11.29	0	101	3.02
Chloroform	7800059	83	11.51	0	103	3.12
1,1,1-Trichloroethane	6939183	97	12.17	0	103	4.48
1,2-Dichloroethane (62)	6123604	62	12.19	0	105	4.31
Benzene	.10109678	78	12.53	0	108	1.37
Carbon Tetrachloride	8727258	117	12.56	0	100	3.30
Trichloroethene	5632408	130	13.26	0	96	3.65
Toluene	14320031	92	14.60	0	98	1.49
Tetrach loroethene	7381911	164	15.47	0	106	4.10
Volume (m1)	20.0			200		
BROMOCHLOROMETHANE(STD 1 DIFLUOROBENZENE (STD 1)		128 114	11.51 12.77	6438434 49010884		

DAILY CONTINUING CALIBRATION CHECK

Cal Date4-1-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.00	1.47	1.48	1
Vinyl Chloride	0.00	0.47	0.46	2
Freon 11	0.02	2.20	2.15	2
1.1-Dichloroethene	0.00	1.04	1.04	0
Dichloromethane	1.85	0.75	0.75	0
Trichlorotrifluoroethane	0.07	1.58	1.58	0
1,1-Dichloroethane	0.00	1.98	1.39	42
c-1,2-Dichloroethene	0.00	0.88	0.61	44
t-1.2-Dichloroethene	0.00	0.92	0.61	51
Chloroform	0.00	1.54	1.59	3
1,1,1-Trichloroethane	0.00	1.37	1.45	5
1,2-Dichloroethane (62)	0.00	1.21	1.41	14
Benzene	0.00	2.00	2.03	1
Carbon Tetrachloride	0.00	1.73	1.72	Ö
Trichloroethene .	0.00	1.11	1.06	5
Toluene	0.00	2.83	3.13	ğ
Tetrach loroethene	0.00	1.46	1.31	12

DUPLICATE SAMPLE/SPIKE RESULTS

Compound	Sample ppbv	Duplicate ppbv	% RPD	QC Limits
Freon 12	0	0.6	200	50
Vinyl Chloride	Ö	0	ERR	50
Freon 11	Ō	385	200	50
1,1-Dichloroethene	0	0	ERR	50
Dichloromethane	0	0	ERR	50
Trichlorotrifluoroethane	0	0	ERR	50
1,1-Dichloroethane	5160	4330	17	50
c-1,2-Dichloroethene	0	0	ERR	50
t-1,2-Dichloroethene	5570	5160	8	50
Chloroform	64.4	53.4	19	50
1,1,1-Trichloroethane	337	334	1	50
1,2-Dichloroethane (62)	827	731	12	50
Benzene	314	277	13	50
Carbon Tetrachloride	2.1	1.5	33	50
Trichloroethene	3050	2170	34	50
Toluene .	8.5	6.8	22	50
Tetrach loroethene	272	233	15	50

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method TO-14 GC/MS	Date: 4-02-91
This OA/OC Depart Applies to the Fel	Davidae Camalaa
This QA/QC Report Applies to the Fol	lowing Samples
CSL Number	
3029 3031 3032 3033 3034 3035 3036 3038 3039 3040 3041	

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	4-02-91	
Check	Typical Value	4-02-91 Value	Units	
Helium Tank Pressure	40	41	psig	
Column Pressure	20	20	psig	
Vacuum	175	156	in Hg	
Zero Air Pressure	10	. 10	psig	
MS Vacuum	7.2	7.6	x 10-5	
Sample Line Leak Check (2min)	5	6	in hg	

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

	4-02-91 Instrument: GC/MS 01 hod TO-14 HP 5890/5971		SO3271A1.D llary Column
m/e	Ion Abundance Criteria	Area	% Abundance
75 95 96 173 174 175	15.0 to 40.0 % of mass 95 30.0 to 60.0 % of mass 95 Base Peak, 100% relative abundance 5.0 to 9.0 % of mass 95 Less than 2.0% of mass 174 Greater than 50.% of mass 95 5.0 to 9.0% of mass 174 95.0 to 101.0 % of mass 174	1108992 3180544 6009344 410560 1000 6042112 451392 5944832	18 53 100 7 0 101 7 98
177	5.0 to 9.0 % of mass 176	400704	.7

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

Standard (100%) S0329A1

Blank B07270A4 Sample Duplicate

Standard (100%) 50329A1				Duplicate	2	
Compound	Standard Area	Quant Ion	RT	Blank	Std Conc ppbv	
Freon 12	11553366	85	4.78	0	101	2.79
Vinyl Chloride	3505083	62	5.79	0	100	3.24
Freon 11	14842433	101	8.30	0	101	1.32
1,1-Dichloroethene	9261225	96	9.19	204535	108	2:10
Dichloromethane	5390698	84	9.55	990300	107	3.50
Trichlorotrifluoroethane	7614431	151	9.43	233124	105	2.07
1,1-Dichloroethane	12790131	63	10.61	0	109	2.30
c-1,2-Dichloroethene	7281782	96	10.29	0	110	3.02
t-1,2-Dichloroethene	7477838	96	11.29	Ó	101	3.02
Chloroform	11688035	83	11.51	30465		3.12
1,1,1-Trichloroethane	10600910	97	12.17	0	103	4.48
1,2-Dichloroethane (62)	. 9413620	62	12.19	Ö	105	4.31
Benzene	15832878	78	12.53	Ó	108	1.37
Carbon Tetrachloride	12579211	117	12.56	14756		3.30
Trichloroethene	10481617	130	13.26	162698		3.65
Toluene	23512553	92	14.60	8510		1.49
Tetrachloroethene	10525511	164	15.47	0		4.10
Volume (ml)	20.0			200		
BROMOCHLOROMETHANE(STD 1 DIFLUOROBENZENE (STD 1)		128 114		6630313 53798718		

DAILY CONTINUING CALIBRATION CHECK

Cal Date4-02-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.00	1.26	1.48	15
Vinyl Chloride	0.00	0.38	0.46	17
Freon 11	0.00	1.62	2.15	25
1,1-Dichloroethene	0.33	1.01	1.01	0
Dichloromethane	2.72	0.59	0.59	0
Trichlorotrifluoroethane	0.44	0.83	0.83	0
1,1-Dichloroethane	0.00	1.40	1.39	0
c-1,2-Dichloroethene	0.00	0.79	0.61	30
t-1,2-Dichloroethene	0.00	0.82	0.61	34
Chloroform	0.04	1.28	1.59	20
1,1,1-Trichloroethane	0.00	1.16	1.45	20
1,2-Dichloroethane (62)	0.60	1.03	1.41	27
Benzene	0.00	1.73	2.03	15
Carbon Tetrachloride .	0.02	1.37	1.72	20
Trichloroethene	0.21	1.14	1.06	8
Toluene	0.00	2.57	3.13	18
Tetrachloroethene	0.00	1.15	1.31	12

DUPLICATE SAMPLE/SPIKE RESULTS

Compound	Sample ppbv	Duplicate ppbv	% RPD	QC Limits
Freon 12	0	9.8	200	50
Vinyl Chloride	0	0	ERR	50
Freon 11	656	0	200	50
1,1-Dichloroethene	0	0	ERR	50
Dichloromethane	0	0	ERR	50
Trichlorotrifluoroethane	0	0	ERR	50
1,1-Dichloroethane	11700	0	200	50
c-1,2-Dichloroethene	0	0	ERR	50
t-1,2-Dichloroethene	6460	22100	110	50
Chloroform	78	133	52	50
1,1,1-Trichloroethane	451	1230	93	50
1,2-Dichloroethane (62)	931	2740	99	50
Benzene	384	1070	94	50
Carbon Tetrachloride	2.8	0	200	50
Trichloroethene .	4250	33400	155	50
Toluene	8.1	41	134	50
Tetrachloroethene	201	422	71	50

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method TO-14 GC/MS	Date: 4-03-91
This QA/QC Report Applies to the Fol	lowing Samples
CSL Number	
3004 3006 3042 3043	•
3044 3045 3046 3047	
3048 3049 3050 3051 3052	

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	4-03-91
Check	Typical Value	4-03-91 Value	Units
Helium Tank Pressure	40	42	psig
Column Pressure	20	19	psig
Vacuum	175	160	in Hg
Zero Air Pressure	10	10	psig
MS Vacuum	7.2	7.7	x 10-5
Sample Line Leak Check (2min)	5	6	in hg

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

Date: 4-03-91 Instrument: GC/MS 01 EPA Method TO-14 HP 5890/5971		File: S03271A1.D DB-5 Capillary Column		
m/e	Ion Abundance Criteria	Area	% Abundance	
50	15.0 to 40.0 % of mass 95	248768	22	
75	30.0 to 60.0 % of mass 95	547136	49	
95	Base Peak, 100% relative abundance	1124352	100	
96	5.0 to 9.0 % of mass 95	70368	6	
173	Less than 2.0% of mass 174	6405	ĺ	
174	Greater than 50.% of mass 95	1045120	93	
175	5.0 to 9.0% of mass 174	74696	7	
176	95.0 to 101.0 % of mass 174	998080	95	
177	5.0 to 9.0 % of mass 176	65576	7	

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

Standard (100%) S04031B1

Blank B04031B1 Sample Duplicate

Compound	Standard Area	Quant Ion	RT	Blank	Std Conc ppbv	
Freon 12	6707985	85	4.78	0	101	2.79
Vinyl Chloride	2417300	62	5.79	0	100	3.24
Freon 11	9435600	101	8.30	0	101	1.32
1,1-Dichloroethene	4686335	96	9.19	301057		2.10
Dichloromethane	3984530	84	9.55	739293	107	3.50
Trichlorotrifluoroethane	7027682	151	9.43	259440	105	2.07
1,1-Dichloroethane	7624160	63	10.61	0	109	2.30
c-1,2-Dichloroethene	4735270	96	10.29	0	110	3.02
t-1,2-Dichloroethene	4982301	96	11.29	0	101	3.02
Chloroform	7883106	83	11.51	39350	103	3.12
l,l,l-Trichloroethane	6786688	97	12.17	0	103	4.48
1,2-Dichloroethane (62)	6159045	62	12.19	0	105	4.31
Benzene	10635648	78	12.53	32234		1.37
Carbon Tetrachloride	8448891	117	12.56	0	100	3.30
Trichloroethene	6244071	130	13.26	117628		3.65
Toluene	14003450	92	14.60	0	98	1.49
Tetrachloroethene	7288984	164	15.47	0	106	4.10
Volume (ml)	20.0			200		
BROMOCHLOROMETHANE(STD 1 DIFLUOROBENZENE (STD 1)		128 114	11.51	3592765 37231277	• • • • • •	

DAILY CONTINUING CALIBRATION CHECK

Cal Date4-03-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.00	0.95	1.48	36
Vinyl Chloride	C. 30	0.34	0.46	25
Freon 11	0.00	1.34	2.15	38
1,1-Dichloroethene	1.36	0.67	0.67	0
Dichloromethane	3.89	0.57	0.57	0
Trichlorotrifluoroethane	0.76	1.00	1.00	0
1,1-Dichloroethane	0.00	1.08	1.39	22
c-1,2-Dichloroethene	0.00	0.67	0.61	10
t-1,2-Dichloroethene	0.00	0.71	0.61	16
Chloroform	0.10	1.12	1.59	30
1,1,1-Trichloroethane	0.00	0.96	1.45	34
1,2-Dichloroethane (62)	0.00	0.87	1.41	38
Benzene	0.06	1.51	2.03	26
Carbon Tetrachloride .	0.00	1.20	1.72	30
Trichloroethene	0.35	0.89	1.06	16
Toluene	0.00	1.99	3.13	36
Tetrachloroethene	0.00	1.03	1.31	21

DUPLICATE SAMPLE/SPIKE RESULTS

Compound	Sample ppbv	Duplicate ppbv	% RPD	QC Limits
Freon 12	0	0	ERR	50
Vinyl Chloride	0	0	ERR	50
Freon 11	0.8	3.3	122	50
1,1-Dichloroethene	0	0	ERR	50
Dichloromethane	0	0	ERR	50
Trichlorotrifluoroethane	0	0	ERR	50
1,1-Dichloroethane	0.9	1.1	20	50
c-1,2-Dichloroethene	0	0	ERR	50
t-1,2-Dichloroethene	48.5	41.4	16	50
Chloroform	0.5	0.6	18	50
1,1,1-Trichloroethane	0.3	0.4	29	50
1,2-Dichloroethane (62)	Ö	0.1	200	50
Benzene	0.5	0.4	22	50
Carbon Tetrachloride	0.1	Ö	200	50
Trichloroethene .	117	118	1	50
Toluene	0.4	0.5	22	50
Tetrachloroethene	0.4	0.4	0	50

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method TO-14 GC/MS	Date: 4-04-91
This QA/QC Report Applies to the	Following Samples
CSL Number	
3011 3014 3021 3025 3030 3039 3053 3054 3055 3056 3057	·

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	4-04-91	
Check	Typical Value	4-04-91 Value	Units	
Helium Tank Pressure	40	42	psig	
Column Pressure	20	20	psig	
Vacuum	175	168	in Hg	
Zero Air Pressure	10	10	psig	
MS Vacuum	7.2	5.6	x 10-5	
Sample Line Leak Check (2min)	5	4	in hg	

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

	4-04-91 Instrument: GC/MS 01 thod TO-14 HP 5890/5971		SO3271A1.D illary Column
m/e	Ion Abundance Criteria	Area	% Abundance
50 75 95 96 173 174 175	15.0 to 40.0 % of mass 95 30.0 to 60.0 % of mass 95 Base Peak, 100% relative abundance 5.0 to 9.0 % of mass 95 Less than 2.0% of mass 174 Greater than 50.% of mass 95 5.0 to 9.0% of mass 174 95.0 to 101.0 % of mass 174	300672 814656 1752576 107408 18344 1607168 118736 1594368	7
177	5.0 to 9.0 % of mass 176	103408	

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

Standard (100%) S04031B1

Blank B04031B1 Sample Duplicate

Stalidard (100%) 50403101						
Compound	Standard Area	Quant Ion	RT	Blank	Std Conc ppbv	
Freon 12	13545812	85	4.78	0	101	2.79
Vinyl Chloride	4235811	62	5.79	59532	100	3.24
Freon 11	18305439	101	8.30	0	101	1.32
1,1-Dichloroethene	7790257	96	9.19	280576	108	2.10
Dichloromethane	8173962	84	9.55	1623935	107	3.50
Trichlorotrifluoroethane		151	9.43	325759	105	2.07
1,1-Dichloroethane	12710760	63	10.61	39451	109	2.30
c-1,2-Dichloroethene	7478263	96	10.29	43230	110	3.02
t-1,2-Dichloroethene	10017791	96	11.29	36165	101	3.02
Chloroform	17250274	83	11.51	0	103	3.12
1,1,1-Trichloroethane	15397111	97	12.17	Ö	103	4.48
	. 12565148	62	12.19	Ŏ	105	4.31
Benzene	22610434	78	12.53	49205	108	1.37
Carbon Tetrachloride	19081758	117	12.56	0	100	3.30
Trichloroethene	13789332	130	13.26	38486	96	3.65
Toluene	19914283	92	14.60	9877	98	1.49
Tetrach loroethene	17614234	164	15.47	49379	106	4.10
Volume (ml)	20.0			200		
BROMOCHLOROMETHANE(STD 1)11200233	128	11.51	12098317		
DIFLUOROBENZENE (STD 1)		114	12.77	****	k	
•••••						

DAILY CONTINUING CALIBRATION CHECK

Cal Date4-04-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.00	1.21	1.48	18
Vinyl Chloride	0.13	0.38	0.46	18
Freon 11	0.00	1.63	2.15	24
1,1-Dichloroethene	0.36	0.70	0.70	0
Dichloromethane	1.97	0.73	0.73	0
Trichlorotrifluoroethane	0.21	1.37	1.37	0
1,1-Dichloroethane	0.03	1.13	1.39	18
c-1,2-Dichloroethene	0.06	0.67	0.61	9
t-1,2-Dichloroethene	0.03	0.89	0.61	47
Chloroform	0.00	1.54	1.59	3
1,1,1-Trichloroethane	0.00	1.37	1.45	5
1,2-Dichloroethane (62)	0.00	1.12	1.41	20
Benzene	0.02	2.02	2.03	ī
Carbon Tetrachloride .	0.00	1.70	1.72	ī
Trichloroethene	0.02	1.23	1.06	16
Toluene	0.00	1.78	3.13	43
Tetrachloroethene	0.03	1.57	1.31	20

DUPLICATE SAMPLE/SPIKE RESULTS

Compound	Sample ppbv	Duplicate ppbv	% RPD	QC Limits
Freon 12	0	0	ERR	50
Vinyl Chloride	Ö	Ö	ERR	50
Freon 11	65.3	32.6	67	50
1.1-Dichloroethene	Ó	0	ERR	50
Dichloromethane	0	0	ERR	50
Trichlorotrifluoroethane	0	0	ERR	50
1,1-Dichloroethane	1.3	1.2	8	50
c-1,2-Dichloroethene	0	0	ERR	50
t-1,2-Dichloroethene	0.1	0	200	50
Chloroform	0.5	0.5	0	50
1,1,1-Trichloroethane	19.4	19	2	50
1,2-Dichloroethane (62)	1	0.9	11	50
Benzene	0.3	0.3	0	50
Carbon Tetrachloride	0.6	0.6	0	50
Trichloroethene .	34.5	35.6	3	50
Toluene	0.1	0.1	0	50
Tetrach loroethene	1.2	1.6	29	50

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method	TO-14 G	C/MS			Date:	04-05-91
This QA/QC	Report	Applies	to the	Following	Samples	
	CSL umber					
	3058 3059 3060 3061 3062					
	3063 3064					

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	04-05-91	
Check	Typical Value	04-05-91 Value	Units	
Helium Tank Pressure	40	42	psig	
Column Pressure	20	19	psig	
Vacuum	175	155	in Hg	
Zero Air Pressure	10	10	psig	
MS Vacuum	7.2	7.1	x 10-5	
Sample Line Leak Check (2min)	5	5	in hg	

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

	04-05-91 Instrument: GC/MS 01 hod TO-14 HP 5890/5971		S04051bl.D llary Column
m/e	Ion Abundance Criteria	Area	% Abundance
50	15.0 to 40.0 % of mass 95	206672	16
75	30.0 to 60.0 % of mass 95	522496	41
95	Base Peak, 100% relative abundance	1263104	100
96	5.0 to 9.0 % of mass 95	86472	7
173	Less than 2.0% of mass 174	7208	1
174	Greater than 50.% of mass 95	1202688	95
175	5.0 to 9.0% of mass 174	80808	7
176	95.0 to 101.0 % of mass 174	1206272	100
	5.0 to 9.0 % of mass 176	86008	7

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

Standard (100%) S04031B1

Blank B04031B1 Sample Duplicate

5411021 C (1557) 55755151			_			
Compound	Standard Area	Quant Ion	RT	Blank	Std Conc ppbv	
Freon 12	7268509	85	4.78	0	101	2.79
Vinyl Chloride	3139302	62	5.79	0	100	3.24
Freon 11	8728213	101	8.30	0	101	1.32
1,1-Dichloroethene	5500027	96	9.19	225811	108	2.10
Dichloromethane	5431812	84	9.55	1007537	107	3.50
Trichlorotrifluoroethane		151	9.43	270275		2.07
1,1-Dichloroethane	7248449	63	10.61	0	109	2.30
c-1,2-Dichloroethene	4307800	96	10.29	ŏ	110	3.02
t-1,2-Dichloroethene	5089202	96	11.29	38072		3.02
Chloroform	9144259	83	11.51	0	103	3.12
1,1,1-Trichloroethane	7109950	97	12.17	ŏ	103	4.48
	6855779	62	12.19	28685		4.31
Benzene	13527397	78	12.53	0	108	1.37
Carbon Tetrachloride	8767558	117	12.56	Ö	100	3.30
Trichloroethene	8420060	130	13.26	118224		3.65
Toluene	11501367	92	14.60	0		1.49
Tetrachloroethene	10151654	164	15.47	Ō	106	4.10
Volume (ml)	20.0		• • • • • • • •	200		
BROMOCHLOROMETHANE(STD 1 DIFLUOROBENZENE (STD 1)		128 114	11.51 12.77	7424677 57745846	• • • • •	••••

DAILY CONTINUING CALIBRATION CHECK

Cal Date04-05-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.00	1.03	1.48	31
Vinyl Chloride	0.00	0.44	0.46	4
Freon 11	0.00	1.23	2.15	43
1,1-Dichloroethene	0.42	0.78	0.78	Ō
Dichloromethane	1.89	0.77	0.77	ŏ
Trichlorotrifluoroethane	0.27	1.44	1.44	Ŏ
1,1-Dichloroethane	0.00	1.02	1.39	26
c-1,2-Dichloroethene	0.00	0.61	0.61	ō
t-1,2-Dichloroethene	0.07	0.72	0.61	18
Chloroform	0.00	1.29	1.59	19
1,1,1-Trichloroethane	0.00	1.00	1.45	31
1,2-Dichloroethane (62)	0.04	0.97	1.41	31
Benzene	0.00	1.91	2.03	6
Carbon Tetrachloride .	0.00	1.24	1.72	28
Trichloroethene	0.13	1.19	1.06	12
Toluene	0.00	1.63	3.13	48
Tetrach loroethene	0.00	1.43	1.31	10

DUPLICATE SAMPLE/SPIKE RESULTS

Compound	Sample ppbv	Ouplicate ppbv	% RPD	QC Limits
Freon 12	0	0	ERR	50
Vinyl Chloride	0	0	ERR	50
Freon 11	0	0	ERR	50
1,1-Dichloroethene	0	0	ERR	50
Dichloromethane	0	0	ERR	50
Trichlorotrifluoroethane	0	0	ERR	50
1,1-Dichloroethane	3.6	5.2	36	50
c-1,2-Dichloroethene	0	0	ERR	50
t-1,2-Dichloroethene	0.3	0.5	50	50
Chloroform	0.4	0.7	55	50
1,1,1-Trichloroethane	175	178	2	50
1,2-Dichloroethane (62)	9	9.3	3	50
Benzene	0.7	0.9	25	50
Carbon Tetrachloride	0	0.2	200	50
Trichloroethene .	42.8	52.7	21	50
Toluene	0.3	0.3	0	50
Tetrach loroethene	1.3	1.8	32	50

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method TO-14 GC/MS	Date:	04-08-91	
This QA/QC Report Applies to the Follo	wing Samples		
CSL Number			
3065 3066 3068 3070 3071 3072			

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	04-08-91
Check	Typical Value	04-08-91 Value	Units
Helium Tank Pressure	40	42	psig
Column Pressure	20	20	psig
Vacuum	175	159	in Hg
Zero Air Pressure	10	10	psig
MS Vacuum	7.2	7.7	x 10-5
Sample Line Leak Check (2min)	5	4	in hg

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

	04-08-91 Instrument: GC/MS 01 hod TO-14 HP 5890/5971	File: SC DB-5 Capil	
m/e	Ion Abundance Criteria	Area	% Abundance
75 95 96 173 174 175	15.0 to 40.0 % of mass 95 30.0 to 60.0 % of mass 95 Base Peak, 100% relative abundance 5.0 to 9.0 % of mass 95 Less than 2.0% of mass 174 Greater than 50.% of mass 95 5.0 to 9.0% of mass 174 95.0 to 101.0 % of mass 174	212608 569792 1454080 96896 9429 1415168 107992	15 39 100 7 1 97 8 97
	5.0 to 9.0 % of mass 176	85768	6

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

Standard (100%) S04031B1

Blank B04031B1 Sample Duplicate

(-					
Compound	Standard Area	Quant Ion	RT	Blank	Std Conc ppbv	
Freon 12	13205590	85	4.78	0	101	2.79
Vinyl Chloride	4838887	62	5.79	0	100	3.24
Freon 11	17473831	101	8.30	0		1.32
1,1-Dichloroethene	10924127	96	9.19	80507	108	2.10
Dichloromethane	9898834	84	9.55	1560312		3.50
Trichlorotrifluoroethane		151	9.43	0		2.07
1,1-Dichloroethane	17270870	63	10.61	Ó	109	2.30
c-1,2-Dichloroethene	7854841	96	10.29	Ō		3.02
t-1,2-Dichloroethene	9153250	96	11.29	25004		3.02
Chloroform	15556018	83	11.51	0		3.12
1,1,1-Trichloroethane	12692975	97	12.17	0		4.48
1,2-Dichloroethane (62)	· 9331966	62	12.19	21162		4.31
Benzene	22529623	78	12.53	0		1.37
Carbon Tetrachloride	15101683	117	12.56	Ō		3.30
Trichloroethene	14678527	130	13.26	Ō		3.65
Toluene	19653165	92	14.60	Ō		1.49
Tetrachloroethene	18454407	164	15.47	0		4.10
Volume (ml)	20.0		•	200		
BROMOCHLOROMETHANE(STD 1 DIFLUOROBENZENE (STD 1)) 13467408 104491188	128 114		11985396 99214568		

DAILY CONTINUING CALIBRATION CHECK

Cal Date04-08-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.00	0.98	1.48	34
Vinyl Chloride	0.00	0.36	0.46	22
Freon 11	0.00	1.30	2.15	40
1,1-Dichloroethene	0.09	0.81	0.81	0
Dichloromethane	1.90	0.74	0.74	0
Trichlorotrifluoroethane	0.00	1.21	1.21	0
1,1-Dichloroethane	0.00	1.28	1.39	
c-1,2-Dichloroethene	0.00	0.58	0.61	8
t-1,2-Dichloroethene	0.03	0.68	0.61	11
Chloroform	0.00	1.16	1.59	27
1,1,1-Trichloroethane	0.00	0.94	1.45	35
1,2-Dichloroethane (62)	0.03	0.69	1.41	51
Benzene	0.00	1.67	2.03	18
Carbon Tetrachloride .	0.00	1.12	1.72	35
Trichloroethene	0.00	1.09	1.06	3
Toluene	0.00	1.46	3.13	53
Tetrach loroethene	0.00	1.37	1.31	5

DUPLICATE SAMPLE/SPIKE RESULTS

Compound	Sample ppbv	Duplicate ppbv	% RPD	QC Limits
Freon 12	0	0	ERR	50
Vinyl Chloride	0	0.1	200	50
Freon 11	1	0.7	35	50
1,1-Dichloroethene	0	0	ERR	50
Dichloromethane	0	0	ERR	50
Trichlorotrifluoroethane	0	0	ERR	50
1,1-Dichloroethane	0.4	0.4	0	50
c-1,2-Dichloroethene	0	0	ERR	50
t-1,2-Dichloroethene	29.3	28.5	3	50
Chloroform	0.3	0.3	Ō	50
1,1,1-Trichloroethane	0.2	0.2	Ō	50
1,2-Dichloroethane (62)	0	0.1	200	50
Benzene	0.5	0.5	0	50
Carbon Tetrachloride	0.1	0.1	Ŏ	50
Trichloroethene .	64.8	63.1	3	50
Toluene	0.4	0.4	Ŏ	50
Tetrach loroethene	0.2	0.1	67	50

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method TO-14 GC/	MS	Date:	04-11-91
***************************************	•••••••••••••••••••••••••••••••••••••••		••••••••••
This QA/QC Report Ap	plies to the Followi	ng Samples	
CSL Number			
3067 3069 3073 3074 3075 3076 3077 3078 3079 3080 3081 3082 3083	3084 3085 3086 3087 3088 3089 3090 3091 3101 3102 . 3103 3104 3105	3106 3108 3109 3110 3111 3112	

DATLY OA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	04-11-91
Check	Typical Value	04-11-91 Value	Units
Helium Tank Pressure	40	42	psig
Column Pressure	20	20	psig
Vacuum	175	160	in Hg
Zero Air Pressure	10	10	psig
MS Vacuum	7.2	8.2	x 10-5
Sample Line Leak Check (2min)	5	3	in hg

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

Date: EPA Met	04-11-91 Instrument: GC/MS 01 shod TO-14 HP 5890/5971	File: SO DB-5 Capil	04051b1.D lary Column
m/e	Ion Abundance Criteria	Area	% Abundance
50	15.0 to 40.0 % of mass 95	17328	18
75	30.0 to 60.0 % of mass 95	37808	40
95	Base Peak, 100% relative abundance	94056	100
96	5.0 to 9.0 % of mass 95	7720	8
173	Less than 2.0% of mass 174	1367	2
174	Greater than 50.% of mass 95	86704	92
175	5.0 to 9.0% of mass 174	6163	7
176	95.0 to 101.0 % of mass 174	88128	102
	5.0 to 9.0 % of mass 176	6476	7

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards. Blanks, Duplicates

Standard (100%) S04031B1

Blank B04031B1 Sample Duplicate

Compound	Standard Area	Quant Ion	RT	Blank	Std Conc ppbv	
Freon 12	8953766	85	4.78	0	101	2.79
Vinyl Chloride	3255275	62	5.79	0	100	3.24
Freon 11	12740103	101	8.30	1118471	101	1.32
1,1-Dichloroethene	5300837	96	9.19	0	108	2.10
Dichloromethane	5069700	84	9.55	0	107	3.50
Trichlorotrifluoroethane	9506266	151	9.43	0	105	2.07
1,1-Dichloroethane	8509018	63	10.61	0	109	2.30
c-1,2-Dichloroethene	4289771	96	10.29	0	110	3.02
t-1,2-Dichloroethene	4795446	96	11.29	145055	101	3.02
Chloroform	9456013	83	11.51	54939	103	3.12
1,1,1-Trichloroethane	8335444	97	12.17	0	103	4.48
1,2-Dichloroethane (62)	5720143	62	12.19	98357	105	4.31
Benzene	12570653	78	12.53	0	108	1.37
Carbon Tetrachloride	10852872	117	12.56	88603	100	3.30
Trichloroethene	7919669	130	13.26	0	96	3.65
Toluene	10307597	92	14.60	64157	98	1.49
Tetrachloroethene	10460064	164	15.47	62743	106	4.10
Volume (ml)	20.0			200		
BROMOCHLOROMETHANE(STD 1) DIFLUOROBENZENE (STD 1)	6252216 52814429	128 114	11.51 12.77	6826638 56544735		

DAILY CONTINUING CALIBRATION CHECK

Cal Date04-11-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %	
Freon 12	0.00	1.43	1.48	3	
Vinyl Chloride	0.00	0.52	0.46	13	
Freon 11	0.81	2.04	2.15	5	
1,1-Dichloroethene	0.00	0.85	0.85	0	
Dichloromethane	0.00	0.81	0.81	0	
Trichlorotrifluoroethane	0.00	1.52	1.52	0	
1.1-Dichloroethane	0.00	1.36	1.39	2	
c-1,2-Dichloroethene	0.00	0.69	0.61	12	
t-1,2-Dichloroethene	0.28	0.77	0.61	26	
Chloroform	0.05	1.51	1.59	5	
1,1,1-Trichloroethane	0.00	1.33	1.45	8	
1,2-Dichloroethane (62)	0.17	0.91	1.41	35	
Benzene	0.00	2.01	2.03	1	
Carbon Tetrachloride .	0.07	1.74	1.72	1	
Trichloroethene	0.00	1.27	1.06	19	
Toluene	0.06	1.65	3.13	47	
Tetrachloroethene	0.06	1.67	1.31	28	

DUPLICATE SAMPLE/SPIKE RESULTS

Compound	Sample ppbv	Duplicate ppbv	% RPD	QC Limits	
Freon 12	0	0	ERR	50	
Vinyl Chloride	Ö	0.2	200	50	
Freon 11	138.5	355.7	88	50	
1,1-Dichloroethene	Ó	0	ERR	50	
Dichloromethane	Ö	Ö	ERR	50	
Trichlorotrifluoroethane	Ō	Ō	ERR	50	
1,1-Dichloroethane	0.3	0.3	0	50	
c-1,2-Dichloroethene	Ò	0	ERR	50	
t-1,2-Dichloroethene	0.3	0.1	100	50	
Chloroform	0.2	0.3	40	50	
1,1,1-Trichloroethane	3.7	3.8	3	50	
1,2-Dichloroethane (62)	0.3	0.2	40	50	
Benzene	0.2	0.1	67	50	
Carbon Tetrachloride	20.7	21.3	3	50	
Trichloroethene .	25.9	26.8	3	50	
Toluene	0.1	0.1	Ŏ	50	
Tetrach loroethene	0.4	0.5	22	50	

McClellan AFB Close Support Laboratory DAILY QUALITY ASSURANCE REPORT

EPA Method TO-14 GC/MS		Date:	04-12-91	
This QA/QC Report Applie	es to the Following	•		
CSL Number				,
3092 3095 3098 3099 3105 3107 3114 3116 3117	3120 3122 3123 3124 3126 3127	•		. • • •

DAILY QA CHECKSHEET

CLOSE SUPPORT LABORATORY McClellan AFB		Date:	04-12-91
Check	Typical Value	04-12-91 Value	Units
Helium Tank Pressure	40	42	psig
Column Pressure	20	20	psig
Vacuum	175	160	in Hg
Zero Air Pressure	10	10	psig
MS Vacuum	7.2	8.2	x 10-5
Sample Line Leak Check (2min)	5	3	in hg

McClellan AFB Close Support Laboratory

VOLATILE ORGANIC GC/MS TUNE AND INTERNAL STANDARD AREA SUMMARY

		Instrument: GC/MS 01		S04051b1.D
EPA Meth	nod T0-14	HP 5890/5971	DB-5 Cap	illary Column

m/e	Ion Abundance Criteria	Area	% Abundance
50	15.0 to 40.0 % of mass 95	12874	34
75	30.0 to 60.0 % of mass 95	17376	46
95	Base Peak, 100% relative abundance	37400	100
96	5.0 to 9.0 % of mass 95	3534	9
173	Less than 2.0% of mass 174	1000	3
174	Greater than 50.% of mass 95	37496	100
175	5.0 to 9.0% of mass 174	4257	11
176	95.0 to 101.0 % of mass 174	39912	106
177	5.0 to 9.0 % of mass 176	1930	5

VOLATILE ORGANIC GC/MS QUALITY ASSURANCE WORKSHEET Standards, Blanks, Duplicates

B04031B1 Blank Sample Duplicate Standard (100%) S04031B1 Standard Quant RT Blank Area Ion Std Conc ppbv Compound Freon 12 7175976 85 4.78 50846
Vinyl Chloride 2646940 62 5.79 0
Freon 11 9558413 101 8.30 40283
1,1-Dichloroethene 5213034 96 9.19 304468
Dichloromethane 3918898 84 9.55 669824
Trichlorotrifluoroethane 7483616 151 9.43 313883
1,1-Dichloroethane 8270599 63 10.61 0
c-1,2-Dichloroethene 4055350 96 10.29 54050
t-1,2-Dichloroethene 411534 96 11.29 13100
Chloroform 7024059 83 11.51 0
1,1,1-Trichloroethane 6082891 97 12.17 0
1,2-Dichloroethane (62) 3964491 62 12.19 0
Benzene 9733330 78 12.53 0
Carbon Tetrachloride 7470209 117 12.56 0
Trichloroethene 5803267 130 13.26 253042
Toluene 12001647 92 14.60 0
Tetrachloroethene 7281155 164 15.47 0 101 2.79 100 3.24 101 1.32 108 2.10 107 3.50 105 2.07 109 2.30 110 3.02 101 3.02 101 3.02 103 3.12 103 4.48 105 4.31 108 1.37 100 3.30 96 3.65 98 1.49 Tetrach loroethene 0 106 4.10 7281155 164 15.47 20.0 BROMOCHLOROMETHANE(STD 1) 3521754 128 11.51 3499516 DIFLUOROBENZENE (STD 1) 31316723 114 12.77 35073734

DAILY CONTINUING CALIBRATION CHECK

Cal Date04-12-91 Initial Cal Date:3-27-91

Compound	Blank (ppbv)	Standard RRF	Initial RRF	RPD %
Freon 12	0.07	2.04	1.48	38
Vinyl Chloride	0.00	0.75	0.46	63
Freon 11	0.04	2.71	2.15	26
1,1-Dichloroethene	0.63	1.48	1.48	0
Dichloromethane	1.84	1.11	1.11	0
Trichlorotrifluoroethane	0.44	2.12	2.12	0
1,1-Dichloroethane	0.00	2.35	1.39	69
c-1,2-Dichloroethene	0.15	1.15	0.61	89
t-1,2-Dichloroethene	0.32	0.12	0.61	81
Chloroform	0.00	1.99	1.59	25
1,1,1-Trichloroethane	0.00	1.73	1.45	19
1,2-Dichloroethane (62)	0.00	1.13	1.41	20
Benzene	0.00	2.76	2.03	36
Carbon Tetrachloride	0.00	2.12	1.72	23
Trichloroethene .	0.42	1.65	1.06	55
Toluene	0.00	3.41	3.13	9
Tetrachloroethene	0.00	2.07	1.31	58

DUPLICATE SAMPLE/SPIKE RESULTS

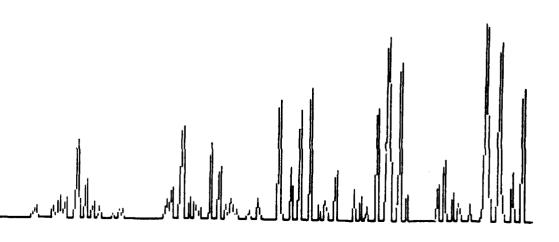
Compound	Sample ppbv	Duplicate ppbv	% RPD	QC Limits
Freon 12	0	0	ERR	50
Vinyl Chloride	Ō	0.1	200	50
Freon 11	Ŏ	0.4	200	50
1.1-Dichloroethene	Ŏ	0	ERR	50
Dichloromethane	Ŏ	Ô	ERR	50
Trichlorotrifluoroethane	Ŏ	0	ERR	50
1,1-Dichloroethane	2.5	2	22	50
c-1,2-Dichloroethene	0	Ō	ERR	50
t-1,2-Dichloroethene	0.6	0.3	67	50
Chloroform	0.5	0.3	50	50
1,1,1-Trichloroethane	156	187.1	18	50
1,2-Dichloroethane (62)	10.5	11.8	12	50
Benzene	0.3	0.3	0	50
Carbon Tetrachloride	0	0	ERR	50
Trichloroethene	62.1	61.3	1	50
Toluene .	0.1	0.1	0	50
Tetrach loroethene	1.7	1.7	0	50

SECTION II SUBCONSULTANT QA/QC REVIEW--OFFSITE LAB



Environmental Analytical Service

ANALYTICAL REPORT
Section 1
McClellan AFB
Off-Site Laboratory
March 20 - April 12, 1991



ANALYTICAL REPORT

Section 1
McClellan AFB
Off-Site Laboratory
March 20 - April 12, 1991

Prepared for:

CH₂M Hill

Prepared by:

Steven D. Hoyt, Ph.D.

ENVIRONMENTAL ANALYTICAL SERVICE, INC. 170 Granada, Suite C San Luis Obispo, California 93401 Phone (805) 541-3666 FAX (805) 541-4550

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- 3.0 QUALITY ASSURANCE
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Section 2

4.0 ANALYTICAL RESULTS AND DAILY QUALITY ASSURANCE REPORTS

CHEM HILL QUALITY ANALYTICS
CHAIN OF CUSTODY RECORD

Michellan Selfors 10 10 10 10 10 10 10 1		PROJECT NUMBER PROJECT N	MME	CLIENT ADDRESS AND PHONE No. 168		FOR LAB USE OMLY
		5	Michillan Sollas			
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The following samples were received for analysis by the methods described in Section 1.2.

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Number	Number	Comments
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MW-BT-0-7-	-2 10405	
MW-BT-0-7-	-2 10406	
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MW-B-0-4-E		
MW-B-0-4-1		
MW-B-0-4-2		
MW-B-0-4-3	10431	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = $\frac{(\$ \text{ recovery test } 1 - \$ \text{ recovery test } 2)}{(\$ \text{ recovery test } 1 + \$ \text{ recovery test } 2)/2}$ x 100

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CH2M HILL SACRAMENTO

MAY 03 1991

RECEIVED

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

Dear Robert:

April 25, 1991

Lab ID: 10403-10431

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 9, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely/

Stepen D. Boy!

President

SDH/sg enclosures

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Numbe	er	Comments
VR-B-0-4	2-B	10550	
VR-B-0-4	2-1	10551	
VR-B-0-4	2-2	10552	
VR-B-0-4	2-3	10553	
VR-B-0-4	2-4	10554	
VR-B-0-6	1-B	10555	
VR-B-0-6	1-1	10556	
VR-B-0-6	1-2	10557	
VR-B-0-6	1-3	10558	
VR-B-0-3	4-B	10559	
VR-B-0-3	4-1	10560	•
VR-B-0-3	4-2	10561	
VR-B-0-3	4-3	10562	
VR-B-0-3	4-4	10563	
VR-V-0-4	2	10564	
VR-V-0-6	1	10565	
VR-V-0-3	4	10566	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = $\frac{(\$ \text{ recovery test } 1 - \$ \text{ recovery test } 2)}{(\$ \text{ recovery test } 1 + \$ \text{ recovery test } 2)/2}$ x 100

CHAIN OF CUSTODY RECORD

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April 25, 1991 Lab ID: 10550-10563 CH2M HILL SACRAMENTO

MAY 03 1991

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

RECEIVED

Dear Rosert:

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 11, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely

President

SDH/sq enclosures

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lat Numb		Comments
VR-B-0-35	5-B	10581	
VR-B-0-35	5-1	10582	
VR-B-0-35	5-2	10583	
VR-B-0-35	5-3	10584	
VR-V-0-35	5	10585	NOT ANALYZED
VR-B-0-39	9-B	10586	
VR-B-0-39	9-1	10587	
VR-B-0-39	9-2	10588	
VR-B-0-39	3-3	10589	
VR-V-0-39	•	10590	NOT ANALYZED
MW-BT-0-7	7-3	10591	
MW-BT-0-7	7-4	10592	
MW-BT-0-7	7-4	10593	
MW-BT-0-7	7-4	10594	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = (\$ recovery test 1 -\$ recovery test 2) x 100 (\$ recovery test 1 +\$ recovery test 2)/2

CHAIN OF CUSTODY RECORD

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April 25, 1991 Lab ID: 10581-10594

CH2M HILL SACRAMENTO

MAY 03 1931

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

RECEIVED

Dear Robert:

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 12, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely,

President

SDE/sg enclosures

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
VR-B-0-36		
VR-B-0-36	_ -	
VR-B-0-36		
VR-B-0-36	5-3 10602	
VR-B-0-13	3-B 10603	
VR-B-0-13	3-1 10604	
VX-B-0-13	3-2 10605	
VR-B-0-13	3-3 10606	
MW-LF-0-7		
MW-LF-0-7	1-1 10608	
MW-LF-0-2		
VR-LF-0-2	2-2 10610	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = (% recovery test 1 - % recovery test 2) x 100 (% recovery test 1 + % recovery test 2)/2

CHAIN OF CUSTODY RECORD

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April 25, 1991 Lab ID: 10599-10610

CH2M HILL SACRAMENTO

MAY 03 1991

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

RECEIVED

Dear Robert:

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 15, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely,

Steven D Moye, Pg.

President

SDE/sg enclosures

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
MW-T-0-9	-B 10357	
MW-T-0-9	7 71111	
MW-T-0-9		
MW-AC-0-		
MW-AC-0-	9-1 10364	
MW-AC-0-	9-2 10365	
MW-AC-0-	9-3 10366	
MW-B-0-9	-1 10367	
MW-B-0-9	-2 10368	
MW-B-0-9	-3 10369	
MW-B-0-9	-4 10370	
MW-B-0-9	-B 10371	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = $\frac{(\$ \text{ recovery test } 1 - \$ \text{ recovery test } 2)}{(\$ \text{ recovery test } 1 + \$ \text{ recovery test } 2)/2}$ x 100

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CH2M HILL SACRAMENTO

MAY 03 1991

RECEIVED

April 24, 1991 Lab ID: 10357-10371

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

Dear Robert:

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 5, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely,

Steven D. Hoy

President

SDH/sg enclosures

CHAIN OF CUSTODY RECORD

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The following samples were received for analysis by the methods described in Section 1.2.

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II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = (% recovery test 1 - % recovery test 2) x 100 (% recovery test 1 + % recovery test 2)/2

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- 3. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = $\frac{(\$ \text{ recovery test } 1 - \$ \text{ recovery test } 2)}{(\$ \text{ recovery test } 1 + \$ \text{ recovery test } 2)/2}$ x 100



CH2M HILL SACRAMENTO

MAY 03 1991

RECEIVED

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

Dear Robert:

April 24, 1991

Lab ID: 10338-010352

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 4, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

SincereAy,

Speven D. Hoyt, Ph.D.

/ President

SDH/sg enclosures



April 30, 1991 Lab ID: Final Samples CHZM HILL SACRAMENTO

MAY 03 1991

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

RECEIVED

Dear Robert:

Enclosed is the analytical report for the final samples run at Environmental Analytical Service for the close support lab at McClellan AFB.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely,

Seeven DV Boyt, Ph.D.

President

SDH/sg enclosures

Sample Description I.

The following samples were received for analysis by the methods described in Section 1.2.

Lab Client Number

Number

Comments

II. Analysis Requested

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ENVIRONMENTAL ANALYTICAL SETTIES

INVOICE

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Past due balances are subject to a 1.5% per month rervice charge, annual rate 13%

Set Total

2400.00

Shipping (Express)

TITAL DUE:

\$2,400.00

Send Payment to: ENVIRONMENTAL ANALYTICAL RESYLLE

170 C Granada

San Luis Obispo. CA 334 1

For Auestions on Invoice:

Sheila Graham 305 > 541-3666

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
MW-AC-0-0	004 10251	
MW-B-0-00		
MW-T-0-00	6 10253	
MW-AC-0-0	10 10254	
MW-B-0-01	1 10255	
MW-S-0-01	.2 10256	
MW-AC-0-0	16 10257	
MW-B-0-01	7 10258	
MW-T-0-01	8 10259	
MW-AC-0-0	20 10260	
MW-B-0-02	1 10261	
MW-S-0-02	2 10262	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-02

10253, 10256, 10259, 10262

GC/MS Full Scan, EPA Method TO-14

10251, 10252, 10254, 10255, 10257, 10258, 10260, 10261

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
- C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = $\frac{(\% \text{ recovery test } 1 - \% \text{ recovery test } 2)}{(\% \text{ recovery test } 1 + \% \text{ recovery test } 2)/2}$

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I. Sample Description

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
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MW-PC-0-2	2-2 10274	
MW-PC-0-2	2-3 10275	
MW-PC-0-2	2-3D 10276	
MW-S-0-2-	-B 10277	
MW-T-0-2-	10278	
MW-S-0-2-	2 10279	
MW-T-0-2-	-3 10280	
MW-B-0-2-	B 10281	
MW-B-0-2-	10282	
MW-B-0-2-	2 10283	·
MW-B-0-2-	-3 10284	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-02

GC/MS Full Scan, EPA Method TO-14

III. Quality Control

load in

DCS results

- Project Specific QC. No project specific QC (i.e., spikes and/or Α. duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
- C. Laboratory Control Samples - The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample order to establish method-specific control limits. The associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = (% recovery test 1 - % recovery test 2) x 100 (% recovery test 1 + % recovery test 2)/2

CHAIN OF CUSTODY RECORD

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I. Sample Description

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
MW-B-0-3-	1 10291	
MW-B-0-3-	2 10292	
MW-B-0-3-	3 10293	
MW-B-0-3-	3D 10294	
MW-B-0-3-	B 10295	
MW-AC-0-3	-1 10296	
MW-AC-0-3	-2 10297	
MW-AC-0-3	-3 10298	
MW-AC-0-3	-B 10299	
MW-S-0-3-	1 10300	
MW-5-0-3-	2 10301	
MW-T-0-3-	3 10302	
MW-T-0-3-	B 10303	
MW-5-0-3-	1D 10304	
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II. Analysis Requested

GC/MS Full Scan, EPA Method TO-02

GC/MS Full Scan, EPA Method TO-14

III. Quality Control

load in

- Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
- C. Laboratory Control Samples - The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = (% recovery test 1 - % recovery test 2) f^{**} recovery test 1 + % recovery test 2)/2

III. Quality Control

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

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Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = $\frac{(\$ \text{ recovery test } 1 - \$ \text{ recovery test } 2)}{(\$ \text{ recovery test } 1 + \$ \text{ recovery test } 2)/2}$ x 100

CHAIN OF CUSTODY RECORD

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1.3 Sample Description and Chain of Custody Sheets

Copies of the Chain of Custody Sheets submitted to the laboratory with the samples are contained in this section of the report.

I. Sample Description

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
MW-T-0-7	-1 10322	
MW-T-0-7	-2 10323	
MW-S-0-7	-3 10324	
MW-T-0-7	-4 10325	
MW-T-0-7	-B 10326	
MW-AC-0-	7-1 10327	
MW-AC-0-	7-2 10328	
MW-AC-0-	7-3 10329	
MW-AC-0-	7-B 10330	
MW-B-0-7	-1 10331	
MW-B-0-7	- 2 10332	
MW-B-0-7	-4 10333	·
MW-B-0-7	-4 10334	
MW-B-0-7	-B 10335	

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

GC/MS Full Scan, EPA Method TO-02

1.0 PROJECT DESCRIPTION

1.1 Analysis Requested

For the off-site contract laboratory, the program called for the analysis of landfill gas samples and condensate samples using the analytical procedures described below.

Component 1: The analysis of about 97 landfill gas samples collected in Tedlar bags using CARB Method 422 with cryotrapping and full scan GC/MS.

Component 2: The analysis of about 51 charcoal sorbent cartridges using EPA Method TO-2 with cryotrapping and full scan GC/MS.

Component 3: The analysis of about 72 SUMMA canister samples using EPA Method TO-14 with cryotrapping and full scan GC/MS.

Component 4: The analysis of landfill condensate samples by EPA Method 8240 using purge and trap and full scan GC/MS.

The samples were shipped to EAS by CH2M Hill and analyzed with the holding times specified by the method. The samples were analyzed by the indicated methods (further described in the Methods Section) using the standard laboratory Quality Assurance procedures described in the EAS Quality Assurance Document (Section 3.3). In addition to the standard laboratory QA, project specific QC criteria were required. These are described in Section 1.2 and 3.2.

1.2 Quality Asssurance

Blanks - A Blank is analyzed with each sample batch and checked to see that the concentration is below 0.2 ppbv for canisters or Tedlar bags. Tedlar bags usually have some components above 0.2 so PQL for analysis is set accordingly.

Duplicates - For duplicates, a mid or high level sample is analyzed twice to determine the Relative Percent Difference (RPD).

 $RPD = (Conc. 1 - Conc. 2) \times 100$ Average Concentration

Replicates - For replicated a canister or bag is spiked at a low concentration and analyzed several times. The Percent Relative Standard Deviation is calculated (RSD) as below.

RSD = Standard Deviation of Measurments x 100
Average Concentration

Standards - NBS traceable standards are analyzed with each sample batch. A 100% standard is analyzed in the morning to verify instrument response, target calibration windows, and initial calibration validity. A 50% calibration standard is analyzed at the end of the day to verify linerity and daily calibration.

CHAIN OF CUSTODY RECORD

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Environmental Analytical Service, Inc.

April 23, 1991 Lab ID: 10372-10383 CH2M HILL SACRAMENTO

MAY 03 1991

RECEIVED

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834

Dear Robert:

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 6, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely,

Steven D. Hoyt, Ph.D. President

SDE/sq enclosures

I. Sample Description

The rollowing samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31 VR-B-0-31	1-1 10373 1-2 10374 1-3 10375 1-4 10376 1-1V 10377 1-2V 10378 1-3V 10379 1-4V 10380 11-1V 10381 131-2V 10382	NOT ANALYZED, NOT ENOUGH SAMPLE

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

III. Quality Control

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
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 - C. Laboratory Control Samples The LCS Program

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Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = (% recovery test 1 - % recovery test 2) x 100
(% recovery test 1 + % recovery test 2)/2

CHEM HILL QUALITY ANALYTICS CHAIN OF CUSTODY RECORD

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Environmental Analytical Service, Inc.

April 23, 1991 Lab ID: 10389-10402 CH2M HILL SACRAMENTO

MAY 03 1991

Robert Koster CH2M Hill 3840 Rosin Court, Suite 110 Sacramento, CA 95834 RECEIVED

Dear Robert:

Enclosed is the analytical report for the samples which was received by Environmental Analytical Service on April 8, 1991.

The report consists of the following sections:

I Sample Description

II Analysis Request

III Quality Control Report

IV Analysis Results

If you have any questions on the analytical data or the report contact Dr. Hoyt at (805) 541-3666.

Sincerely,

Steven D. Hoyt, Ph.D. President

SDH/sq enclosures

I. Sample Description

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Comments
MW-B-0-6	-B 10389	
MW-B-0-6	-1 10390	
MW-B-0-6	-2 10391	
MW-B-0-6	-3 10392	
MW-AC-0-	6-B 10393	
MW-AC-0-	6-1 10394	
MW-AC-0-	6-2 10395	
MW-AC-0-	6-3 10396	
MW-AC-0-	6-4 10397	
MW-T-0-6	-B 10398	
MW-T-0-6	-1 10399	
MW-S-0-6	-2 10400	
MW-T-0-6		
MW-S-0-6		

II. Analysis Requested

GC/MS Full Scan, EPA Method TO-14

GC/MS Full Scan, EPA Method TO-02

III. Quality Control

- A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.
- B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.
 - C. Laboratory Control Samples The LCS Program

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The DCS results associated with your samples are on the attached Duplicate Control Sample Report.

Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

RPD = $\frac{(\$ \text{ recovery test } 1 - \$ \text{ recovery test } 2)}{(\$ \text{ recovery test } 1 + \$ \text{ recovery test } 2)/2}$ x 100

CHAIN OF CUSTODY RECORD

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Environmental Analytical Service, inc.

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STATUS: URGI	ENT CONFIDENTIAL ROU	TINE
	11.0 G	•
Date:	Robert Roster	
ATTENTION:		
COMPANY:	CH2M HILL	
FAX Number:	(916) azo 8463	
NUMBER OF PAG	GES TO FOLLOW:	
SENT BY:	Vivian Longaire	
1	ENVIRONMENTAL ANALYTICAL SERVICE, I	NC.
	170-C Granada San Luis Obispo, CA 93401	*-
MESSAGE: Rope	obert - I think your pu with these teso	will Hs.
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If this	box is checked, please sign and tra	
cover page b	ack to us, to serve as confirmation	receipt.
Received by:	De	te

ENVIRONHENTAL ANALYTY TAY WE'VE TE

INVOICE

Sacramento ATTN: Acco	Court, Buite III , CA - 95834 unts Payacle nager: - Pobert Koster	Invoice Invoice	Number: Date: Period: Number:	1544 4/3/91 April CH1010
P.O. No: PROJECT:	N/A McClellan AFP Scil Bas	P.J.Date: Prideou Number:		
Quant	Description		Unit	Amount
1	Set-up Close Su McClellan AFB M Demonstrational		4580.00	4580.CO
1	Recovery Studey	, Tedlar Bag	1760.00	1760.00
1	Recovery Study.	Solid Sorbent	1120.00	1120.00
i	Recovery Study,	Canister Analysis	1120.00	1120.00

TERMS: NET 30 DAYS Past due balances are subject to a 1.5% per month service charge, annual rate 18%

Sub Total 3580.00 Shipping (Express)

MOTAL DUE: \$8,580.00 ------

Send Payment to:
TNVIRONMENTAL ANALYTICAL SERVICE .70 C Granada San Luis Chispo, CA 98401

For Questions on Invoice: Sheila Graham (305) 541-3666

Toluene

Carbon Tetrachloride

Trichloroethene

Tetrachloroethene

not detected

not detected not detected

7.8



V'LATILE ORGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-02: GC/MS Ful	l Scan		
Client: CH2M Hill Site: MW-BT-0-7-2 (1st) Tube #: 1009		Lab #: Date Sampled: Date Analyzed:	4-6-91
Compound	NDL Vg	Concentration ug	
Freon 12	0.10	1.2	******
Vinyl Chloride	0.10	5.0	
Freon 11	0.10	0.59	
1,1-Dichloroethene	0.10	32	
Dichloromethane	0.10	not detected	
Trichlorotriflouroethene	0.10	130	
1,1-Dichloroethane	0.10	6.0	
c-1,2-Dichloroethene	0.10	not detected	
t-1,2-Dichloroethene	0.10	C . 62	
Chloroform	0.10	0.31	
1,1,1-Trichloroethane	0.10	0. 99	
1,2-Dichloroethane	0.10	1.7	
Benzene	0.10	0.15	

0.10

0.10

0.10

0.10



VOLATILE CRGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-02:	GC/MS	Full	Scan
-------------------	-------	------	------

Client: CH2M Hill Site: MW-BT-0-7-2 (2nd) Tube #: 1000		Lab #: Date Sampled: Date Analyzed:	
Compound	MDL	Concentration ug	
Freon 12	0.10	not detected	
	0.10	not detected	
Freon 11	0.10	not detected	
1.1-Dichloroethene	0.10	not detected	
	0.10	not detected	
richlorotrifloursethane	0.10	0.28	
1.1-Dichloroethane	0.10	not detected	
-1.2-Dichloroethene	0.10	not detected	
t-1,2-Dichloroethene	0.10	not detected	
Chloroform	0.10	not detected	
l,l,l-Trichloroethane	0.10	not detected	
1,2-Dichloroethane	0.10	not detected	
Benzene	0.10	not detected	
Carbon Tetrachloride	0.10	not detected	
Trichloroethene	0.10	not detected	
Toluene	0.10	not detected	
Tetrachloroethene	0.10	not detected	



VOLATILE ORGANIC COMPOUND ANALYSIS REPORT

	Lab #: 10404 Date Sampled: 4-6-91 Date Analyzed: 4-9-91
DL	Concentration ug
.10	not detected
	IDL ug 3.10 3.10 3.10 3.10 3.10 3.10 3.10 3.10



VOLATILE ORGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-C2: GC/MS Full Scan Client: CH2M Hill Lab #: 10403 Date Sampled: 4-6-91 Date Analyzed: 4-9-91 Site: MW-BT-C-7-1 (1st) Tube #: 1009 MDL Concentration Compound ug ug not detected Freon 12 0.10 0.10 Vinyl Chloride 2.6 9.10 0.32 Freon 11 1.1-Dichloroethene 0.10 27 0.10 13 Dichloromethane Trichlorotriflouroethane 0.10 not detected 1.1-Dichloroethane 0.10 4.1 c-1.2-Dichloroethene 0.10 not detected t-1,2-Dichloroethene 0.10 0.43 Chloroform 0.10 not detected 1.1.1-Trichloroethane 0.10 0.49 0.13 not detected 1,2-Dichloroethane not detected 0.10 Benzene Carbon Tetrachloride 0.10 not detected 0.10 6.1 TrichLoroethene not detected 0.10 Toluene 0.10 not detected Tetrachloroethene



GLOBAL **GEOCHEMISTRY** CORPORATION

TELEX 4720127 F4X 818,992-8940

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318-992-4103

MAY OB 109

GC/MS Analytical Summary

RECEIVED

Date 04-13-91

Client EAS Samples received:04-12-91

Samples collected: Samples analyzed: 04-17-91

Volatile Organics - EPA 8240

GGC ID 6565 h. :h. 1 Client ID VR-V-O Blank 61

DL Found Found Found Compounds ug/l ug/l ug/l ug/l Dichlorodifluoromethane 250 nd nd nd Trichlorofluoromethane 50 nd nd nd Vinyl chloride 50 nd nd nd 1,1-Dichloroethene 50 nd nd nd Dichloromethane 50 nd nd nd 1,2-Dichloroethene 50 nd nd nd 1,1-Dichloroethane 50 nd nd nd Chloroform 50 nd nd nd Trichlorotrifluoroethane 50 nd nd nd 1,1,1-Trichloroethane 50 nd nd nd 1,2-Dichlorcethane 50 nd nd nd Carbon Tetrachloride 50 пd nd nd 1,1,2-Trichlorcethane nd 50 E.T. nd Tetrachloroethene 50 nd r.d nd Trichloroethene 50 ೧ಡ nd nd Benzene 50 nd nd nd Toluene 50 nd nd nd

Analyst Jahar Zupezin Supervisor

TELEX 4720:27 FAX 8:8,992.8940

6919 ETON AVENUE • DANOGA PARA • DAL FORN A 91003/2194 518/992/4103

GC/MS Analytical Summary

Date 04-18-91

Client EAS Samples collected:

Samples received:04-12-91 Samples analyzed: 04-17-91

Volatile Organics - EPA 6240

GGC ID 6565

Meth. 3 4 Blank 43 44 Client ID VR-V-0

Compounds	DL ug/l	Found ug/l	Found ug/l	Found ug/l	
Dichlorodifluoromethane	50	nd	nd	nd	
Trichlorofluoromethane	10	nd	nd	nd	
Vinyl chloride	10	nd	nd	nd	
1,1-Dichloroethene	10	nd	nd	nd	
Dichloromethane	10	nd	nd	nd	
1,2-Dichloroethene	10	nd	nd	nd	
1,1-Dichloroethane	10	nd	nd	nd	
Chloroform	10	nd	nd	nd	
Trichlorotrifluoroethane	10	nd	nd	nd	•
1,1,1-Trichloroethane	10	nd	nd	nd	
1,2-Dichloroethane	10	nd	nd	nd	
Carbon Tetrachloride	10	nd	nd	nd	
1,1,2-Trichloroethane	10	nd	nd	nd	
Tetrachloroethene	10	nd	nd	nd	
Trichloroethene	10	nd	nd	nd	
Benzene	10	nd	nd	nd	
Toluene	10	nd	nd	nd	

Analyst Silver Zupern Supervisor Hlunfeften

VOLATILE MATRIX SPIKE RECOVERY

Client EAS

Date 04-18-91

Sample ID #6565-3

Compound	Spike added ug/l	Recovery %	
Trichlorofluoromethane	40	55	_
Chloroform	40	91	
1,1,1-Trichloroethane	40	103	
Carbon tetrachloride	40	102	
Toluene	40	83	

VOLATILE SURROGATE RECOVERY

Client EAS	Date	04-13-91
GGC=6565-3		

			*=========
Sample	S1	S2	S3
=======================================	===========	=======================================	*========
1. VR-V-0-61	90	77	91
2. VR-V-0-34	98	85	98
3. VR-V-0-43	94	78	95
4. VR-V-0-44	98	80	101
	***====		

			Ac Timires, s	•
S1	=	1,2-Dichloroethane-d4	66 - 124	
S2	=	Toluene-d8	68 - 130	
S3	=	Bromofluorobenzene	66 - 125	

Samples were analyzed by inserting two needles into the original sample vial. One needle, carrying the inlet purging gas, was inserted below the liquid level. The second needle, carrying the outlet purging gas, was near the top of the vial. The outlet purging gas was directed into the purge and trap device containing water to which was added surragate and matrix spike compounds. Samples were purged at 40°C according to the conditions for EPA Method 8240.

office/hoyt.met

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2.0 ANALYTICAL METHODS

2.1 Description of Analytical Methods

Volatile Organic Compounds by GC/MS

The samples were analyzed by EPA proposed Method TO-14 for ambient air sampling and analysis. The method uses cryotrapping to preconcentrate the air and gas samples which are separated on a fused silica capillary column and analyzed by full scan gas chromatography/mass spectrometry (GC/MS). A 500 to 1000 ml ambient air sample or a 1.0 to 20.0 ml landfill gas sample is transferred from the air sampling container to the freezout loop is immersed in liquid oxygen and concentrates the sample. The sample is desorbed from the cryotrap at 85C and is cryofocussed onto the beginning of a narrow bore 30 meter fused silica capillary column with a 1.0 micron phase loading. column is temperature programmed to 200 C. spectrometer is scanned from 33 AMU. The GC/MS is tuned and operated according to the specifications in EPA SW-846 Method 8240. Target compounds are identified quantitated from extracted ion chromatograms using two characteristic ions and retention times. Additional tentatively identified compounds (TIC'S) are identified using a PBM computer search of the NIST 49,000 compound library. The method detection limit (MDL) is listed on the analytical report, and the reproducibility of the method is about 10-15% for most compounds at 1 ppbv.

Sorbent Cartridges

The sorbent cartridges will be analyzed using EPA Method TO-2 using the Nutech 8533 Thermal Desorber and Cryogenic Preconcentrator. For this project carbon molecular seive (CMS) cartridges will be used, precleaned according to the procedures outlined in TO-2. All 51 of the sorbent cartridges will be supplied at the beginning to the project. After sampling, the cartridges are attached to the Nutech 8533 and thermally desorbed at 375 C to the cryogenic trap for concentration along with gaseous internal standards. The trap is cooled to -150 C with liquid nitrogen and the sample is concentrated. The sample is desorbed from the cryotrap at 100 C and is cryofocussed onto the beginning of a narrow bore 30 meter capillary column with a 1.0 micron phase fused silica loading. The column is temperature programmed to 200 C. The mass spectrometer is scanned from 33 amu to 250 amu. GC/MS is tuned and operated according to the specifications in EPA SW-846 Method 8240. Target compounds are identified and quantitated from extracted ion chromatograms using two characteristic ions and retention times. Additional tentatively identified compounds (TIC's) are identified using a PBM computer search of the NIST 49,000 compound library. The method detection limit (MDL), is 0.2 ppbv for most compounds and the reproducibility of the method is about 10-15% for compounds at 1 ppbv.

EPA 8240 Condensate Samples

The condensate samples will be analyzed using EPA 8240 using an HP 5970/5890 GC/MS and an OI Model 4460A Purge and Trap Concentrator. The Purge and Trap is directly interfoced to a narrow bore capillary column as described in EPA Method 524.2. The MDL for the system is better then 0.2 ppbv for the purgable compounds. The samples are purged according to Method 8240 and cryofocussed onto the beginning of a narrow bore 30 meter fused silica capillary column with a 1.0 micron phase loading. The column is temperature programmed to 200 C. The mass spectrometer is scanned from 33 amu to 250 amu. The GC/MS is tuned and operated according to the specifications in EPA SW-846 Method 8240. Target compounds are identified and quantitated extracted ion chromatograms using two characteristic ions Additional tentatively identified and retention times. compounds (TIC's) are identified using a PBM computer search of the NIST 49,000 compound library. The method detection Limit (MDL), is 0.2 ppbv for most compounds and the reproducibility of the method is about 10-15% for compounds The samples are calibrated against commercial at 1 ppbv. purgable standards and internal standards.

2.2 Standard Operating Procedures

The standard operating Procedures used by the off-site laboratory, Environmental Analytical Service, Inc. of San Luis Obispo, CA are enclosed in this section.

Analysis of Volatile Organic Compounds in Air by GC/MS EPA Method TO-14

1.0 Standardization

- a. Make sure zero air is flowing thru at 50 ml/min on digital flow meter.
- b. Place freezeout loop in liquid 02.
- c. Connect standard line to standard cylinder. Bubble standard thru desired loop (2 ml) on 8-port valve.
- d. Rotate standard valve. Allow Zero Air to flow thru for a minute or longer.
- e. Bubble Internal Standard thru the 2.0 ml loop.
- f. Rotate standard valve. Allow Zero Air to flow thru for a minute or longer.
- g. Place capillary column in liquid 02.
- h. Remove liquid O2 on frezeout loop, rotate valve and place freezeout loop in hot water dewar.
- g. Set timer to 2.5 minutes
- i. On GC/MS system enter the data aquisition program and set up data collection file for standard. Standard files are formatted as follows: S(todays date)(last digit of year)A(run number).D
- j. When timer has about 20-30 seconds left turn on cryo.
 On GC panel hit CLEAR. ENTER.
- i. At 2.5 minutes and when cryo has equilibrated, pull capillary column out of liquid 02 while simultaneously starting the GC/MS run by hitting the GO softkey.
- j. Rotate freezeout loop to Load position and remove hot water dewar.

- 2.0 Loading of Zero Air Blanks.
 - a. Make sure zero air is flowing thru at 50 ml/min on digital flow meter.
 - b. Place freezeout loop in liquid 02.
 - c. Bubble Internal Standard thru the 2.0 ml loop.
 - d. Set Timer for 10 minutes (500ml) and let zero air load into freezeout loop.
 - e. Rotate standard valve.
 - f. After the 500 ml has been loaded, turn off zero air.
 - g. Place capillary column in liquid 02.
 - h. Remove liquid O2 on frezeout loop, rotate valve and place freezeout loop in hot water dewar.
 - i. Set timer to 2.5 minutes
 - j. On GC/MS system enter the data aquisition program and set up data collection file for blank. Blank files are formatted as follows: B(todays date)(last digit of year)A(run number).D
 - k. When timer has about 20-30 seconds left turn on cryo. On GC panel hit CLEAR. ENTER.
 - 1. At 2.5 minutes and when cryo has equilibrated, pull capillary column out of liquid O2 while simultaneously starting the GC/MS run by hitting the GO softkey.
- m. Rotate freezeout loop back to Load position and remove hot water dewar.
- 3.0 Loading Ambient Air Samples.
 - a. Connect canister to sample intake line.
 - b. Place freezeout loop in liquid 02.
 - c. Subble Internal Standard thru the 2.0 ml loop.
 - d. Set Timer for 15 minutes (750ml), open canister and load into freezeout loop.
 - e. Rotate standard valve.

- f. After sample has loaded,(when the timer goes off),
 close valve on canister.
- g. Place capillary column in liquid 02.
- h. Remove liquid 02 on frezeout loop, rotate valve and place freezeout loop in hot water dewar.
- i. Set timer to 2.5 minutes
- j. On GC/MS system enter the data aquisition program and set up data collection file for sample. Sample files are formatted as follows: Lab Number A(run number).D
- k. When timer has about 20-30 seconds left turn on cryo. On GC panel hit CLEAR. ENTER.
- 1. At 2.5 minutes and when cryo has equilibrated, pull capillary column out of liquid O2 while simultaneously starting the GC/MS run by hitting the GO softkey.
- m. Rotate freezeout loop back to Load position and remove hot water dewar.
- 4.0 Loading of Landfill or Source Canisters.
 - a. Make sure zero air is flowing thru at 50 ml/min on digital flow meter.
 - c. Place freezeout loop in liquid 02.
 - c. Connect standard line to Internal Standard cylinder. Bubble standard thru 2ml loop on 8-port valve.
 - d. Rotate standard valve. Allow Zero Air to flow thru for a minute or longer.
 - e. Connect sample canister to standard line, bubble sample thru the 10 ml loop.
 - f. Rotate standard valve. Allow Zero Air to flow thru for a minute or longer.
 - g. Place capillary column in liquid 02.
 - h. Remove liquid O2 on frezeout loop, rotate valve and place freezeout loop in hot water dewar.
 - g. Set timer to 2.5 minutes

-Standard Operating Procedure- Sorbent Tube Analysis using Nutech Concentrator 8533 and GC/MS, EPA Method TO-2

- 1. Standardization
- a. Attach a blank sorbent tube to tube inlet on Nutech.
- b. Make sure V1 is in vent position. Bubble standards thru V1 and inject by switching V1 from vent to inject.
- c. After loading standards and internal standards by repeating step (b), turn sorbent tube over so the top is now at the bottom and vice versa.
- d. Make sure V6 is in sample position. Place cryotrap in LO2
- e. Replace oven housing around sorbent tubes, set timer for 10 minutes and let load for 10 minutes.
- f. When timer is up, place the capillary column in LO2.
- g. Turn V6 to in column position and place cryotrap in hot water for 2.5 minutes.
- h. Turn on cryo on GC/MS and cool oven down.
- i. When oven has reached equilibrium, pull capillary column out of LO2 while simutaneosly starting the run on GC/MS.
- Turn V6 back to in sample position
- k. Remove oven housing around sorbent tubes, slide oven back and keep housing closed to retain heat. Let sorbent tubes cool to room temperature.
- 2.0 Blanks Thru Sorbent Tube.
- a. Follow steps a thru k above, except load only internal standard onto sorbent tube.
- 3.0 Sorbent Samples.
- a. Note that there is a I and an O on either side of the sorbent tube.
- b. Attach to concentrator with the I side of tube on bottom.
- c. Bubble internal standard thru V1 injecting onto tube.
- d. Turn tube over so that the I is now at the top, (closest to concentrator) and the O is on bottom.
- e. Proceed with Standard (1.0) loading steps d thru k above

3.0 QUALITY ASSURANCE

3.1 Project QC Summary

Each analytical batch (by day analyzed) has a QC report containing the blank and duplicate concentrations. These are given in Section 2 with the analytical reports. The table on the next page reviews the data by day and identifies days where criteria was only partially met or if there were any other analytical problems. Specific corrective actions are indicated if necessary. For a general description of corrective actions see the EAS QA/QC manual in Section 3.3.

The laboratory QC criteria were met on all of the analysis batch days except for the following:

3/28/91 - The RPD for t-1,2-DCE was 59% instead of 50%. This was not determined to be a serious problem since the %RPD was within limits the following days.

4/12/91 - The RPD for Dichloromethane was 55% instead of 50%.

On days when no QC report was listed, the samples in the batch were sorbent tubes, and the blank and duplicates are supplied by the field samplers, since multiple analysis of the sorbent tubes is not possible.

The daily instrument blanks had concentrations below 0.2 ppbv, but some of the blanks on Tedlar bags had concentrations of Dichloromethane and Toluene above the detection limit. This is common for Tedlar bags which generally contain these compounds as contaminants even if the bags are thoroughly flushed before use.



Date	Daily Blank	Duplicate
	CO ₂ ppbv	RPD <50%
3/22/91	Yes	Yes
3/27/91	No Report (tubes)	103
3/28/91	Yes	t-1,2-DLE 59%
3/29/91	Yes	Yes
3/30/91	Yes	Yes
4/1/91	Yes	Yes
4/3/91	Yes	Yes
4/4/91	No Report (tubes)	
4/5/91	Yes	Yes
4/6/91	Yes	Yes
4/8/91	Yes	Yes
4/9/91	No Report (tubes)	_
4/10/91	Yes	Yes
4/11/91	Yes	Yes
4/12/91	Yes	Dichloromethane 55%
4/13/91	Yes	Yes
4/14/91	Yes	Yes
4/15/91	Yes	Yes
4/16/91	Yes	Yes
4/17/91	No Report (tubes)	_
4/18/91	Yes	Yes
4/19/91	No Report (tubes)	

3.2 Project QC Checks for Off-Site Laboratory

The standard daily QC checks used by EAS are described below. In addition to these routine QC checks the McClellan AFB project has additional project specific QC checks. The data for these are in Sections 3.2.1 to 3.2.4.

GC/MS TUNE (GC/MS ONLY)

The GC/MS tune is checked each day with BFB according to the procedures described for Volatile Organic Compounds in EPA Method TO-14 and Method 8240.

INTERNAL STANDARD AREA SUMMARY (GC/MS ONLY)

The range of acceptable internal standard response is determined from one of the 100% standard runs for that day using the criteria described in EPA Method 8240. The acceptable range is from 75% to 125%.

STANDARDIZATION

For ambient air and landfill gas samples, standardization is done using commercial NBS traceable gas standards obtained from Scott-Marrin or Scott Specialty Gases. Each standard cylinder contains between 5 and 10 compounds at the 0.5 to 5 ppmv range. The standards are diluted using a static dilution system depending on the compounds requested to be analyzed. More than one standard cylinder is often used for calibration to obtain standard data for all compounds.

CONTINUING CALIBRATION

A daily two point calibration is done on one or more of the standard cylinders to check the initial calibration curve used to establish the method performance. The standard area of the 100% standard and 50% standard are divided by their internal standard areas to determine the RRF relative to the internal standard. The percent deviation is checked to see if it is under the AC limit of 25%.

INITIAL CALIBRATION

An initial five point calibration curve is gererated for each of the analytical methods. The relative response factors (RRF) from the daily continuing calibration are compared to the initial calibration curve data.

GC/MS by EPA Method TO-14

Calculation of RRF for benzene RRF50

 3.2.1 Seven Replicate Canister Spikes



Canister #49
Volatile Organic Spike Recovery Summary Sheet

Date: 3-27-91

rations:							
Run 1 ppbv	Run 2 ppbv	Run 3 ppbv	Run 4 ppbv	Run 5 ppbv	Run 6 ppbv	Run 7 ppbv	% RSD
24.0	26.6	16.0	22.0	19.7	21.1	14.1	19.8
46.1	46.1	22.3	37.4	35.2	30.8	35.0	21.5
22.6	22.4	16.8	19.0	17.9	18.2	18.0	11.0
25.0	25.2	20.6	21.2	19.1	19.0	20.3	11.2
37.0	36.8	29.0	31.1	30.2	29.9	33.5	9.5
93.9	95.0	76.4	80.2	75.1	76.9	50.9	17.3
24.9	24.8	26.9	19.1	20.5	18.3	20.5	14.0
38.0	38.6	37.7	33.2	31.5	31.0	31.2	9 4
40.6	40.4	34.0	36.2	33.3	35.2	32.9	
37.3	38.2	33.1	33.9	30.7	32.6	30.7	ક
15.5	14.9	13.1	13.8	12.8	13.7	12.6	7.3
38.6	38.6	32.8	34.8	32.0	34.1	32.0	7.6
			30.8	28.2	29.2	27.5	8.8
14.8	14.9	12.8	13.7	12.6	13.4	11.8	8.0
35.2	34.8	30.4	32.2	28.9	30.7	26.6	9.2
	Run 1 ppbv 24.0 46.1 22.6 25.0 37.0 93.9 24.9 38.0 40.6 37.3 15.5 38.6 35.1 14.8	Run 1 Run 2 ppbv ppbv 24.0 26.6 46.1 46.1 22.6 22.4 25.0 25.2 37.0 36.8 93.9 95.0 24.9 24.8 38.0 38.6 40.6 40.4 37.3 38.2 15.5 14.9 38.6 38.6 35.1 33.7 14.8 14.9	Run 1 Run 2 Run 3 ppbv ppbv ppbv 24.0 26.6 16.0 46.1 46.1 22.3 22.6 22.4 16.8 25.0 25.2 20.6 37.0 36.8 29.0 93.9 95.0 76.4 24.9 24.8 26.9 38.0 38.6 37.7 40.6 40.4 34.0 37.3 38.2 33.1 15.5 14.9 13.1 38.6 38.6 32.8 35.1 33.7 28.8 14.8 14.9 12.8	Run 1 Run 2 Run 3 Run 4 ppbv ppbv ppbv ppbv 24.0 26.6 16.0 22.0 46.1 46.1 22.3 37.4 22.6 22.4 16.8 19.0 25.0 25.2 20.6 21.2 37.0 36.8 29.0 31.1 93.9 95.0 76.4 80.2 24.9 24.8 26.9 19.1 38.0 38.6 37.7 33.2 40.6 40.4 34.0 36.2 37.3 38.2 33.1 33.9 15.5 14.9 13.1 13.8 38.6 38.6 32.8 34.8 35.1 33.7 28.8 30.8 14.8 14.9 12.8 13.7	Run 1 Run 2 Run 3 Run 4 Run 5 ppbv ppbv ppbv ppbv ppbv 24.0 26.6 16.0 22.0 19.7 46.1 46.1 22.3 37.4 35.2 22.6 22.4 16.8 19.0 17.9 25.0 25.2 20.6 21.2 19.1 37.0 36.8 29.0 31.1 30.2 93.9 95.0 76.4 80.2 75.1 24.9 24.8 26.9 19.1 20.5 38.0 38.6 37.7 33.2 31.5 40.6 40.4 34.0 36.2 33.3 37.3 38.2 33.1 33.9 30.7 15.5 14.9 13.1 13.8 12.8 38.6 38.6 32.8 34.8 32.0 35.1 33.7 28.8 30.8 28.2 14.8 14.9 12.8 13.7	Run 1 Run 2 Run 3 Run 4 Run 5 Run 6 ppbv ppbv ppbv ppbv ppbv 24.0 26.6 16.0 22.0 19.7 21.1 46.1 46.1 22.3 37.4 35.2 30.8 22.6 22.4 16.8 19.0 17.9 18.2 25.0 25.2 20.6 21.2 19.1 19.0 37.0 36.8 29.0 31.1 30.2 29.9 93.9 95.0 76.4 80.2 75.1 76.9 24.9 24.8 26.9 19.1 20.5 18.3 38.0 38.6 37.7 33.2 31.5 31.0 40.6 40.4 34.0 36.2 33.3 35.2 37.3 38.2 33.1 33.9 30.7 32.6 15.5 14.9 13.1 13.8 12.8 13.7 38.6 38.6 32.8 34.8	Run 1 Run 2 Run 3 Run 4 Run 5 Run 6 Run 7 ppbv ppbv ppbv ppbv ppbv ppbv ppbv 24.0 26.6 16.0 22.0 19.7 21.1 14.1 46.1 46.1 22.3 37.4 35.2 30.8 35.0 22.6 22.4 16.8 19.0 17.9 18.2 18.0 25.0 25.2 20.6 21.2 19.1 19.0 20.3 37.0 36.8 29.0 31.1 30.2 29.9 33.5 93.9 95.0 76.4 80.2 75.1 76.9 50.9 24.9 24.8 26.9 19.1 20.5 18.3 20.5 38.0 38.6 37.7 33.2 31.5 31.0 31.2 40.6 40.4 34.0 36.2 33.3 35.2 32.9 37.3 38.2 33.1 33.9 30.7 32.

3.2.2 Seven Replicate Bag Spikes





Tedlar Bag Volatile Organic Spike Recovery Summary Sheet

Date: 3-15-91

Concent	rations:							
Compound	Bag 1 ppbv	Bag 2 ppbv	Bag 3 ppbv	Bag 4 ppbv	Bag 5 ppbv	Bag 6 ppbv	Bag 7 ppbv	% RSD
Freon 12	43.5	44.6	39.4	32.7	53.4	47.1	54.3	15.7
Vinvl Chloride	62.8	59.7	58.8	55.4	75.4	49.2	36.7	19.5
Freon 11	29.7	30.7	32.1	22.0	27.6	16.8	23.2	19.7
l.l-Dichloroethene	37.8	35.5	36.3	33.1	44.2	33.1	37.5	9.5
Dichloromethane	55.0	48.4	41.7	45.6	61.8	38.2	41.6	16.3
Trichlorotriflouroethane	415.0	371.0	397.0	371.6	391.8	351.0	310.0	8.6
l.1-Dichloroethane	39.4	35.9	37.3	34.9	45.4	33.5	37.7	9.6
Chloroform	45.4	41.5	44.0	40.3	62.2	38.7	44.8	16.1
l.1.1-Trichloroethane	48.2	→ 0.6	47.0	40.2	47.6	38.3	47.2	8.8
l.2-Dichloroethene	48.9	40.8	47.2	41.5	49.1	38.7	47.7	8.9
Benzene	19.1	15.7	18.2	15.9	18.5	14.8	18.1	8.9
Carbon Tetrachloride	44.4	37.3	42.7	37.7	43.8	35.2	42.8	8.4
Trichloroethene	43.8	36.4	41.0	35.8	41.7	34.5	41.3	
Toluene	28.7	22.3	27.8	22.1	26.3	21.4	27.5	1
Tetrachloroethane	39.8	33.3	37.6	32.8	25.6	31.0	36.9	15.5

3.2.3 Seven REplicate Sorbent Tube Spikes



rbent Tube #2001 latile Organic Spike Recovery Summary Sheet Date: 3-26-91

Conce Compound	ntrations: Run l ng	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	% RSD
			•••	··· ·	••••	··· ·	···>	
reon 12	23.0	29.3	25.1	24.3	23.1	23.9	21.3	9.
.nvl Chloride	9.7	11.2	10.0	9.4	9.4	9.0	8.4	8.6
ceon 11	24.0	31.6	27.5	26.0	24.9	24.3	22.4	10.7
1-Dichloroethene	19.3	24.4	21.4	20.6	19.0	18.6	17.4	10.6
chloromethane	16.8	19.5	19.6	16.8	17.8	14.5	16.3	9.7
1-Dichloroethane	16.1	20.3	16.9	20.4	18.0	18.5	17.8	8.1
nloroform	24.0	27.6	24.1	24.7	25.5	23.1	25.0	5.4
1.1-Trichloroethane	34.3	32.5	36.3	32.6	36.3	36.4	38.9	6.1
2-Dichloroethene	20.5	20.3	22.8	20.5	22.9	20.2	23.1	6.0
enzene	7.1	6.4	7.3	6.6	7.8	6.8	7.8	7.0
rbon Tetrachloride	46.2	48.1	49.9	47.9	54.0	54.7	59.9	8.7
cichloroethene	58.8	57.1	66.7	59.1	68.0	65.9	72.1	8.3
luene	11.9	10.8	13.4	10.6	13.9	10.0	13.5	12
trachloroethane	112.1	104.0	129.3	106.3	130.9	107.1	134.4	10

3.2.4 Performance Evaluation Samples



VOLATILE ORGANIO COMPOUND ANALYSIS REPORT

EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill
Site: Audit Cylinder
Can #: 152 Lab #: Q05131A1

Date Sampled:

Date Analyzed: 5-13-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	Q. 2 7	not detected	not detected
Vinyl Chloride	0.27	1.0	2.6
Freon 11	•0.27	0.56	3.2
1,1-Dichloroethene	0.27	not detected	not detected
Dichloromethane	0.27	2.9	10
Trichlorotriflouroethane	0.27	not detected	not detected
1,1-Dichloroethane	0.27	not detected	not detected
c-1,2-Dichloroethene	0.27	not detected	not detected
t-1,2-Dichloroethene	∪. <u>2</u> 7	not detected	not detected
Chloroform	0.27	1.2	5.6
1,1,1-Trichloroethane	<u>. 27</u>	0.66	3.6
1.2-Dichloroethane	J. 27	1.2	4.8
Benzene	0.27	1.0	3.2
Carbon Tetrachloride	0.27	1.3	8.1
Trichloroethene	0.27	1.2	6.2
Toluene	0.27	0.61	2.3
Tetrachloroethene	0.27	1.2	8.0



VOLATILE ORGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #:

Lab #: Q05131A5
Date Sampled:
Date Analyzed: 5-13-91 Site: Audit Cylinder Can #: 368

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.68	not detected	not detected
Vinyl Chloride	ს.68	12	31
Freon 11	0.68	6.7	38
1,1-Dichloroethene	·0.68	not detected	not detected
Dichloromethane	0.58	14	50
Trichlorotriflouroethane	0.68	not detected	not detected
1,1-Dichloroethane	0.58	not detected	not detected
c-1,2-Dichloroethene	0.68	not detected	not detected
t-1,2-Dichloroethene	0.58	not detected	not detected
Chloroform	O. 68	14	69
1,1,1-Trichloroethane	Ð. 58	7.3	40
1,2-Dichloroethane	0.68	14	57
Benzene	0.58	13	40
Carbon Tetrachloride	0.68	15	97
Trichloroethene	0.68	14	76
Toluene	0.68	7.0	27
Tetrachloroethene	0.68	15	99



VOLATILE ORGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: Audit Cylinder Can #: 368 Lab #: Q05131A4
Date Sampled: Lab #:

Date Analyzed: 5-13-91

	Date Anal	, y z e d .
MDL ppbv	Concentration ppbv	Concentration ug/m3
0.68	not detected	not detected
ე.68	12	30
0.68	6.4	36
•0.68	not detected	not detected
0.68	15	51
0.68	not detected	not detected
0.68	not detected	not detected
0.68	not detected	not detected
0.68	not detected	not detected
0.68	13	65
0.68	7.0	38
ე. 68	13	5 4
0.68	11	36
0.68	15	92
0.68	14	73
0.68	6.6	25
0.68	15	93
	0.68 0.68 0.68 0.68 0.68 0.68 0.68 0.68	MDL Concentration ppbv pbv 0.68 not detected 0.68 12 0.68 6.4 0.68 not detected 0.68 13 0.68 13 0.68 13 0.68 11 0.68 15 0.68 14 0.68 6.6



VOLATILE ORGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-14: GC/MS Full Scan

Lab #: Q05131A2 Date Sampled: Client: CH2M Hill Lab #:

Site: Audit Cylinder Can #: 152

Date Analyzed: 5-13-91

Call #. 152		•	2ed. J-13-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.18	not detected	not detected
Vinyl Chloride	0.18	1.0	2.6
Freon 11	0.18	0.55	3.1
1,1-Dichloroethene	·0.18	not detected	not detected
Dichloromethane	0.18	2.0	6.8
Trichlorotriflouroethane	0.18	not detected	not detected
1,1-Dichloroethane	0.19	not detected	not detected
c-1,2-Dichloroethene	0.18	not detected	not detected
t-1,2-Dichloroethene	0.18	not detected	not detected
Chloroform	0.18	1.2	5.6
1,1,1-Trichloroethane	0.18	0.62	3.4
1,2-Dichloroethane	0.13	1.2	4.7
Benzene	0.18	1.0	3.3
Carbon Tetrachloride	0.18	1.3	8.3
Trichloroethene	0.18	1.1	6.1
Toluene	0.18	0.62	2.3
Tetrachloroethene	0.18	1.2	8.4

3.3 EAS Quality Assurance Document

QUALITY ASSURANCE MANUAL

Air Sampling and Analysis Ambient Air and Landfill Gas Analylsis

Prepared by:

Dr. Steven D. Hoyt

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1.0 INTRODUCTION

Environmental Analytical Service, Inc. (EAS), is located in San Luis Obispo, California and Special Analytical Services Laboratory providing services to consulting engineers, industrial clients, commercial laboratories, and regulatory agencies. EAS specializes in the analysis of ambient air and source samples for the following programs.

Ambient Air Analysis for Toxic Organic Compounds

Calderon Landfill Analysis

Toxic Hot Spots, AB2588

Hydrocarbon Speciaiton for Ozone Modeling

Volatile Organic Compound Analysis by GC/MS

EAS is equipped to analyze toxic organic compounds, chlorinated hydrocarbons, sulfur gases, and permanent gases. A GC/MS (mass spectrometer) system is used for analysis of complex samples and for compound verification. EAS is using the GC/MS for primary analysis and for confirmation of other GC samples. Most of the analytical work done by EAS is on large-scale projects requiring frequent, ongoing collection of large numbers of samples and issuing monthly or quarterly reports and has had considerable experience on the handling of SUMMA canisters.

EAS has done considerable work in the area of methods development especially on the use of full scan GC/MS for the analysis of ambient air samples, and indoor air pollutants. Dr. Steven Hoyt has published numerous papers of trace organic analysis and has developed methods to collect analyze urban air samples for hydrocarbons and chlorinated hydrocarbons, especially for identifying and quantitating individual hydrocarbons at the parts-per-billion level for use in modeling residual organic carbon. He has also developed an integrated sampler to collect ambient air samples of Calderon Landfill testing and for studies of ROC compounds in Santa Barbara, and for VOC compounds in landfills in San Bernardino County. EAS has also had experience in analysis of reduced sulfur compounds on NOAA oceanographic studies on acid rain precursors in the Gulf of Mexico.

1.1 QA Policy and Objectives

This Quality Assurance (QA) manual provides documentation of the quality assurance program used by Environmental Analytical Service, Inc. (EAS) to validate

analytical data generated for air and gas measurement programs. EAS specialized in the analysis of air and gas samples by EPA method TO-14 and the corporate policy is that data quality and traceabliity is the prime mission of all employees. The manual includes detailed information on management policies, facilities and equipment, documnet control, analytical methodology, data generation, quality control, and quality assurance.

While EAS conducts reasearch into method development and publishes papers on the analysis of air toxics, all testing done on client samples for programs and regulatory agencies, are done using standard methods that are documented in the EAS Standard Operating Procedure Manual. These methods come from the EPA ambient air methods manual, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, California Air Resources Board Stationary Source Test Methods, and California Air Resources Board Ambient Toxics Sampling and Analytical Procedures, EPA Compendium of Methods for the Determination of Air Pollutants in Indoor Air, and EPA SW-846 Test Methods for Evaluating Solid Waste.

2. LABORATORY ORGANIZATION AND PERSONNEL.

2.1 Introduction

The organizational chart for EAS is shown in Figure 2.1. The chart outlines the accountability of each person in the organization. The responsibilities and duties of each position on the chart are presented in Section 2.2.

2.2 QA Management and Responsibilities

This section describes the duties and responsibilities of each position in EAS, Inc. with emphasis on the quality assurance program.

2.2.1 Organization

2.2.2.1 Laboratory Director

The Laboratory Director is responsible for project management and the coordination of lab operations and field work. He consults with the Laboratory Supervisor to schedule the sampling and analysis to minimize lab delays and maintain rapid turn-around time. The Laboratory Director determines the analytical capabilities of the lab and what analyses are to be done.

The Laboratory Director coordinates the quality assurance program with the Quality Assurance Supervisor, the Sample Control Officer, and the Lab Supervisor. He works on the development and review of the Quality Assurance Document and reviews the Standard Operating Procedures established by the Lab Supervisor. The Lab Director is responsible for deciding on the corrective actions to be taken for laboratory problems.

The Lab Director maintains a cooperative and safe working environment. He sees that the staff receives training for their positions, and is continually kept informed of current developments in the field.

2.2.2.2 Quality Assurance Supervisor

The Quality Assurance Supervisor is responsible for drafting and implementing the laboratory Quality Assurance Document. He establishes the daily quality assurance tests that are to be performed, and verifies that these tests are completed and reported properly. He coordinates with the Laboratory Supervisor in the preparation and scheduling of blanks, duplicates, and spiked samples.

The Quality Assurancet Supervisor works with the Sample Control Officer to establish a filing system for the data

and reports. He verifies that samples are logged in properly and the custody sheets are properly filled out.

The Quality Assurance Supervisor checks the bookkeeping and analytical procedures to be sure the quality assurance procedures developed for a program are being carried out and properly documented.

He coordinates with the Laboratory Director in arranging for interlaboratory comparisons and calibrations, and to be sure that the most current calibration procedures and standards are being used.

2.2.2.3 Air Laboratory Supervisor

The Laboratory Supervisor assists in developing the analytical procedures and Standard Operating Procedures for all laboratory work. He works with the Laboratory Director to prepare a schedule for analyzing the incoming samples to maintain a rapid turn-around time. The Laboratory Supervisor schedules and verifies that routine maintenance is performed on all instruments and equipment. He prepares calibration standards, establishes the correct concentration of the standards, and supervises the use of the standards. The Laboratory Supervisor does the initial servicing of all instruments and places service calls when necessary. He supervises the Laboratory Technicians, schedules work hours and provides training.

2.2.2.4 Sample Control Officer

The Sample Control Officer is responsible for logging in samples as they are received from clients. He also fills out the billing sheets and the laboratory worksheets. He maintains custody over the samples, and tracks the progress of samples through the laboratory. The Sample Control Officer merges all data and information on a sample, and maintains the filing system. He supervises the sample canister log and ships clean canisters to the client. The Sample Control Officer works with the Quality Assurance Supervisor to file all quality control data with the appropriate samples, and to file all daily blanks and standards.

2.2.2.5 Laboratory Technician

The Laboratory Technician's responsibilities include routine daily instrument checks, analysis of scheduled blanks, standards, quality control samples, and the analysis of scheduled samples. The technician performs initial checks on the validity of the data, and reports on any possible difficulties to the Laboratory Supervisor. The

technician transfers all data to the computer and prints out the initial data report.

He places raw data and completed spreadsheets in a data file and transfer the file to the Laboratory Director for review of the data reports. He maintains a computer disc file of all raw chromatographic data. The technician works with the Laboratory Supervisor on method development and keeping the Standard Operating Procedures current. He records data in the log books, maintains the quality control charts, and logs in samples when the Sample Control Officer is not present.

The technician is responsible for processing sample canisters and recording data about the canisters in the Sample Canister Logbook.

2.2.3 Assignment of QA and QC Responsibilities

The QA and QC duties and tasks are assigned and supervised by the Quality Assurance Supervisor. Each technician is responsible for the operation, calibration, and data reporting for their particular instrument and have prepared the SOP's for the daily analysis, QA procedures, and QC objectives. These are reviewed by the QA Supervisor, who then provides periodic checks and reviews to make sure they are implemented.

2.2.4 Reporting Relationships

The Organizational chart (Figure 2.1) outlines the general reporting relationship of each person in the organization. The philosophy of EAS is that each technician is responsible for calibration, analysis, routine maintenance, QC, and data reporting for their particular instrument. They report directly to the Air Lab Supervisor who is also the Technical Director, who assists them in data interpretation and reviewing the final reports. Since EAS is specialized in air and gas analysis the number of personnel in the laboratory is such that a close, working team relationship is maintained between the technical director, lab technicians, and clerical on all projects.

2.2.5 QA Document Control Procedures

The Administrative Director at EAS is in charge of the document control for the laboratory. EAS maintains files and copies on all QA documents issued. When changes are implementated in the QA procedures, memos are prepared and attached to the current document. When significant changes are made a new version of the document is printed and dated. The old versions are picked up and replaced with the new document. A staff meeting is called to alert personnel to the new changes in the document.

2.2.6 QA Assessment Procedures

The effictiveness of the QA program is assessed by the QA supervisor using the following methods.

- 1) Results of QC check samples.
- 2) Review of QC Control Charts.
- 3) Review of QA report submitted by analyst with each report.
- 4) Ssurveys passed out at staff meetings.
- 5) Discussions with clients on data.
- 6) QA Audits by outside agencies or companies.

2.3 Personnel

2.3.1 Resumes

The resumes of the key personnel are shown in Figure 2.2a,b,c,d.

Lisa H. Hoyt: Administrative Director

Steven D. Hoyt, Ph.D.: Technical Director/Lab Supervisor

Vivian Smith: QA Supervisor/Sample Custodian

Sheila Graham: Report/Office Manager

2.3.2 Training Programs

Dr. Steve Hoyt is a recognized experto on the analysis of ambient air samples and landfill gas samples by EPA method TO-14. He has written papers and presented talks on this topic at national meetings. Dr. Hoyt also teaches part-time at Cal Poly San Luis Obispo in the Chemistry and Environmental Engineering Departments. AT EAS Dr. Hoyt provides discussions and training on the theory and operation of equipment for analyzing samples by TO-14. Lab personnel attend meetings, short courses, and classes at Cal Poly.

3.0 Facilities and Equipment

EAS has been in the air toxics measurment business for over 5 years and has an established location in San Luis Obispo, California. EAS specializes in ambient air and landfill gas analysis and has state-of-the-art equipment for analyzing these samples. Since EAS has done SAS conctract work for EPA, all the necessary equipment, standards, document control, and report generation equipment are in place.

3.1 Instrumentation

A list of the analytical equipment owned by EAS and located in San Luis Obispo is given in Table 3.1. In the

five years of operation EAS has never lost a sample due to lack of operating equipment.

3.2 Maintenance Activities and Schedules.

- 1. An instrument maintenance sheet is kept on each piece of instrumentation. This sheet is used to list any maintenance performed and preventative maintenancedone as recommended by the manufacturer.
- 2. Instrument calibration logs are maintained for each analytical system. Any calibration work and the results are recorded in this log.
- 3. Service contracts are maintained on the gas chromatographs and Hewlett Packard service personnel will respond in 48 hours to any maintenance problems that cannot be serviced in house. EAS has personnel that are trained to repair most equipment problems.

4.0 DOCUMENT CONTROL

4.1 Laboratory Records and Notebooks

The laboratory records are in integral part of sample custody and quality assurance. The laboratory records can be divided into two categories, those dealing with the sample and those dealing with quality assurance.

4.2 Sample Tracking/Custody Records

All of the sample custody records generated for a given sample are attached together and are filed with the raw data in the customer file.

- 1. Sample Custody Form (Figure 4.1): A chain of custody form is sent with each sample canister. This form is filled out at the time of collection with date, time, integrated sampler, number, location, technician collecting sample, can number, can pressure, and other observations. Included on the sheet are places to sign for sample transfer. When a sample arrives at the lab, the lab number and the can pressure are entered on the sheet. A client file is generated for the samples received and the chain of custody sheets placed in the file. The file is placed in the active box until all analysis are complete. As data is collected for the sample it is immediately placed in this file.
- 2. Laboratory Log Book: Each sample is entered into a bound log book kept at the EAS laboratory. From this book a unique laboratory number is assigned to the can. In addition, the date, time, can number, can pressure, location, and client are entered along with the person receiving the sample.
- 3. Laboratory Worksheet (Figure 4.2): When a sample is logged-in, a laboratory worksheet is generated for the sample. The worksheet has general information about the sample, the date received, the expiration date, and a list of analysis to be performed on the sample. This sheet follows the sample through the lab until all analyses have been performed and is dated and signed by the analyst running the test. Any comments about the sample by the analyst are recorded on this sheet.
- 4. Instrument Log: Each chromatograph has a log book where each sample run on the machine is recorded by day run. The book shows the can number, the sample number, the volume injected, a description of the sample, and the method file used to analyze the sample. A Sample Instrument log is shown in Figure 4.3.

4.3 Sample Data Processing

1. Computer Spreadsheet: Each day as a standard and blank are run, the data is entered into the computer template spreadsheet for that day. As a sample is run a sample worksheet is generated from the template and the data are entered into the spreadsheet. The computer calculates the concentrations of the compound, checks the retention times, and subtracts the blank values to give the final results. As the final spreadsheet is generated the analyst reviews all data and chromatograms to verify its validity. The computer prints out a computer worksheet, a client report, a copy of the standard and blank for that day. These are reviewed and signed by the lab director. A copy of the client report is sent to the client, and the rest of the information is placed in the sample file.

4.4 Quality Assurance Records

Files are kept on all quality assurance tasks. These files are kept according to date so information on the machine performance on the day a particular sample was run is easily accessible.

- 1. Daily Quality Assurance Sheets lists the instrument parameters that are to be checked each day before samples are run. The Lab Supervisor lists the blanks, standards, and QA samples to run that day. Any observations about the instrument performance.
- 2. Initial Five or Three Point Calibration: The calculated response factors and raw data are stored in a file along with the chromatograms and calibration data. The initial calibration data is formatted in the EPA CLP format.
- 3. Sample Canister Log: Data on each of the sample canisters is maintained in a log book. This included the date in service, cleaning dates, leak tests, vacuum tests, and stability tests.
- 4. Quality Assurance Charts (Figure 4.4): These are the standard EPA forms for plotting quality control data for air monitoring. Charts are maintained for range and mean values. These are described in more detail in Section 6.4.

4.5 Storage of Raw Data and Reports

Each sample set has a file folder which is generated when the sample is received in the laboratory. Initially the file folder contains the chain of custody sheets for the samples and is placed in the active file bin. As analytical data is collected it is placed in the file and attached to the appropriate chain of custody sheet. All of the raw data and paperwork for a sample are placed in the file folder and the complete package stapled together and kept as a

permanent record filed under the client's name by sample number.

The finished file will contain the raw chromatograms for the sample, the computer spreadsheet showing the calculations, the integrated areas for the standard run that day, the areas for the blank run that day, a copy of the QA sample results, the chain of custody sheet, the laboratory worksheet, and the final client report. All of this material is stapled together for each sample into a complete package.

5. ANALYTICAL METHODOLOGY

5.1 RECEIPT AND REVIEW OF ORDER DOCUMENTS

The sample custodian is responsible for receiving and logging in samples. The shipping container is examined for the presence or absence of custody seals and their condition. Airbills are signed and dated (month/day/year/time) and filed in an airbill folder. In the event that the container arrives with an airbill sticker which cannot be removed for filing, all shipping and tracking numbers are noted in the sample receipt log.

The type of sample and its container's condition is examined, including the presence or absence of custody seals, and the presence or absence of sample tags. The sample custodian is responsible for signing and dating (month/day/year/time) in ink the chain of custody forms at the time samples are logged in.

All documentation, sample tags, sample labels, and custody seals are closely scrutinized for verification of agreement or non-agreement of information.

5.2 Calibration Standards

There are two types of calibration standards used by EAS. The standards used for the routine analytical tests are commercial NBS traceable gas standards nornally ordered at a concentration of 5 ppbv in AL150 cylinders. Special inhouse standards are prepared for special projects where commercial standards are not available and for determining the retention times for many of the individual hydrocarbons.

5.2.1 Quantitative Standards

The concentrations of the individual hydrocarbons are determined by their uniform carbon response on the FID. This procedure is the recommended calibration π procedure and has been shown to be accurate to 5 to 8% (Lonneman, 1979).

the primary calibration standard used for the light and heavy hydrocarbons is a NBS traceable reference gas standard obtained from Scott-Marrin, Riverside, CA. The specifications of the standard are shown in Figure 5.3.1.(a) the light hydrocarbon fraction is calibrated against propane and the nonlaromatic fraction of the heavy hydrocarbons are calibrated against hexane. The aromatic hydrocarbons are calibrated against benzene. The standard cylinder is returned every year for recalibration by the manufacturer. The concentrations of the hydrocarbons in the standard are converted to parts per billion carbon (ppbC) using the procedure described by Westbert et. al. (1984).

The concentrations of the individual compounds are determined by using an External Calibration procedure, in which the compound's response is compared to the response of a standard. The primary calibration standard is an NIST traceable reference gas standard obtained from Scott-Marrin, Inc., Riverside, CA. The standard cylinder is returned every year for recertification by the manufacturer. EAS maintains cylinders with standards for most of the EPA VOC and TO-14 target compounds.

Standards for aldehyde determinations will be prepared as described in ARB Method 110.

Intercomparison of the light and heavy hydrocarbon runs can be made using both the propane peak and the hexane peak. The propane peak can be used because the heavy loaded column is capable of separating the lighter hydrocarbons.

5.2.2 Qualitative Calibration

The retention times are calibrated against commercial gas standard blends of different compounds and from laboratory standards prepared from neat materials.

The commercial gas blends are available from Ideal Gas Products and Scott Specialty Gases. These standards are used to establish retention times and to check concentrations obtained from the NBS traceable standard.

Laboratory standards are prepared from pure materials for those compounds not available in gas blends. Known quantities of the pure materials are diluted with a measured volume of "zero air". Dilutions are made in stainless steel canisters and are stable for use in retention time calibrations for several months.

5.2.3 Calibration Procedures

The calibration procedures for the GC and GC/MS analysis of ambient air and landfill gas samples is given below.

5.2.3.1 Hydrocarbons

5.2.3.2 GC/MS Compounds

The GC/MS Compounds are calibrated by using a dilution of the NBS traceable standard. The daily calibration consists of a zero point and two calibration points (10% and 100% of range). One calibration point is run at the beginning of the day and one at the end of the day. During the monthly internal audit of the analytical system a 5 point calibration curve is run to establish performance criteria for the system. The response factors for the initial calibration curve to be within 10%. If the response factor for the daily standard is more then 30% from the initial calibration a new calibration curve is prepared. Standards are prepared by using a gas dilution system on the chromatograph or by making static dilutions atmospheric levels. The gas dilution system is constructed from an 8 port gas sampling valve with a 0.05 mL, 0.5 mL, The loops are filled with the and 5.0 sample loops. standard and flushed with humidified "zero air" prepared with an AADCO Model 737 pure air generator. three loop sizes are used to prepare a three point calibration of the system to check the linearity in the concentration range of interest. The gas dilution system is used for the daily instrument calibration. concentration of the individual hydrocarbons is determined using the response factors calculated by the integrator.

Standards at atmospheric concentration levels are prepared by diluting the NBS traceable standard in stainless steel canisters. The standards are diluted by using a calibrated syringe to inject a measured volume of the NBS traceable standard into a passivated stainless steel canister. The canister is filled with a known volume of zero air measured using a mass flow meter. This ambient level standard is sent to another laboratory for calibration against the NBS 5 ppbv VOC standard. The diluted standard is run in exactly the same manner as the samples and serves as a check of the sample concentration injection system.

5.2.3.2 GC/MD Compounds

The GC/MD (Multiple Detectors) Compounds are calibrated by using a dilution of the NBS traceable standard. The daily calibration consists of a zero point and two calibration points (10% and 100% of range). One calibration point is run at the beginning of the day and one at the end of the day. During the monthly internal audit of the analytical system a 5 point calibration curve is run to establish performance criteria for the system. If the

response factor for daily standard does not fall within 30% of the initial calibration a new initial calibration is prepared. Standards are prepared by using a gas dilution system on the gas chromatograph or by making dilutions to atmospheric levels. The gas dilution system is constructed from an 8 port gas sampling valve with a 0.05 mL, 0.5 mL, and 5.0 sample loops. The loops are filled with the standard and flushed with humidified "zero air" prepared with an AADCO Model 737 pure air generator. The three loop sizes are used to prepare a three point calibration of the system to check the linearity in the concentration range of interest. The gas dilution system is the daily instrument calibration. concentration of the individual compounds is determined using the calculated response factors in the integrator.

Standards at atmospheric concentration levels are prepared by diluting the NBS traceable standard in stainless steel canisters. The standards are diluted by using a calibrated syringe to inject a measured volume of the NBS traceable standard into a passivated stainless steel canister. The canister is filled with a known volume of humidified zero air measured using a mass flow meter. This ambient level standard is sent to another laboratory for calibration against the NBS 5 ppbv VOC standard. The diluted standard is run in exactly the same manner as the samples and serves as a check of the sample concentration injection system.

5.3 SAMPLE CONTAINER QUALITY ASSURANCE

5.3.1 SUMMA Canister Cleaning and QA

The quality assurance program on the sample canisters starts when the canisters are first constructed. When the electropolished canister is received it is inspected internally to visually verify that all surfaces and welds are polished. New canisters are leak tested by pressurizing the canister to 40 psig and submerging it in water and checking for bubbles. If none are found the canister is assigned a number and the number and the results of the pressure test are entered into the log book. The canister is then steam cleaned overnight (minimum of 12 hours).

The air sampling canister is then placed in a $110\sqrt{C}$ oven and evacuated to 10 microns of vacuum. The canister is capped and stored under vacuum for three days. If the final vacuum is measured and found to be 29.9" Hg (gauge pressure) the canister is ready for use. The canister is then marked as passing the vacuum test in the sample canister log book (Figure 4.1).

After use for sample collection the canisters are placed in a 110 C oven and evacuated to 10 microns vacuum. Canisters that do not reach this level of vacuum are retested for leaks by the above procedure. Cans that are received at the lab that do not have the same can pressure as they did when collected in the field are re-tested for leaks.

The standard laboratory QA procedure is ten percent of the canisters that are recycled are filled with zero air and run as blanks to look for contamination from carryover in the processing step. If contamination is found additional remedies such as increasing the sample processing time, using an intermediate zero air flush or steam cleaning are necessary. For special QA programs the individual canisters are tested on the GC/FID to measure the total hydrocarbons, and chromatograms are supplied for each canister. This service has to be requested in advance and involves an additional charge.

5.3.2 Standard Operating Procedures for Sample Container Preparation.

The actual procedures used to prepare the sample containers for use are described.

- 5.3.2.1 Preparation of Sampling Canisters for Sample Collection
- 1. Check pressure to sampling canister. If canister is under positive pressure vent canister.
- 2. Connect sampling canister to vacuum system line.
- 3. Check to be sure liquid nitrogen trap on vacuum system is full and pump is producing 10 micron vacuum.
- 4. Place sampling canister in over at 110√C.
- 5. Open valve on vacuum system line, and check for leaks in connecting line.
- 6. Open valve on sample canister slowly and pump can down slowly, then open valve fully.
- 7. Leave sample canister connected for 6 hours and verify vacuum of 10 microns in canister.
- 8. Close sampling canister valve.
- 9. Close vacuum system line valve.

- 10. If the sampling can will sit more than 48 hours before shipment to sampling site, fill sample canister with "zero" air at 20 psig. Place red sticker on can and put on storage shelf.
- 11. Place cap on sample canister.
- 12. Record status of sample canister in log book.
- 13. Cans filled with zero air for storage are to be evacuated to 10 microns before shipment to sampling site. After evacuation remove red sticker and place on shipment shelf. Record in log book.
- 5.3.2.2 Preparation of Tedlar Bags for Sampling
- 1. Visully check the Tedlar bags for leaks.
- 2. Connect Tedlar bag to Zero air machine and fill until bag is taught.
- 3. Let bag sit for at least 1 hr and check for leakage.
- 4. Connect bag to vacuum line and evacuate bag.

- 5. Fill bag with zero air and evacuate three times to clean bag.
- 6. Analyze one bag per batch for the project target compounds, and establish blank levels.
- 7. Analyze all bags if called for in project QA.
- 8. Place Tedlar bags in light tight cardboard box, and ship to client. Bags should be shipped within 48 hrs of flushing.

5.4 SAMPLE ANALYSIS

5.4.1 Introduction to Analytical Methodology

Environmental Analytical Service, Inc. (EAS) will do the chemical analysis of samples using approved methods for the project. Depending on the type of sample and the regulator that the results will be reported to, methods from one of the following sources will be used. The bold characters are the prefix used with the method number to indicate the source of the method. Only generally accepted modifications to the methods are made.

EPA Environmental Protection Agency

EPA ambient air methods manual, <u>Compendium of Methods</u> for the <u>Determination of Toxic Organic Compounds in Ambient Air</u>,

EPA Compendium of Methods for the Determination of Air Pollutants in Indoor Air, and EPA SW-846 Test Methods for Evaluating Solid Waste.

APCA Air and Waste Management Association

APCA Intersociety Committee, <u>Methods of Air Sampling</u> and Analysis

ASTM American Society of Testing Materials

EAS Environmental Analytical Service

Special Method developed by Environmental Analytical Service from original research, testing, and literature search.

The methods used by EAS are listed below by the method number the letters in front of the number indicate the source of the method. A description of the method and any

modifications are described along with some of the QA objectives.

5.4.2 AMBIENT AIR ANALYSIS BY EPA METHOD TO-14

EPA TO-14 Hydrocarbon by GC/FID

The heavy hydrocarbons and oxygenates (aldehydes and ketones) are analyzed using an HP 5890 gas chromatograph with a fused silica capillary column. Major components that cannot be identified using FID can be confirmed on an HP 5890/5970 GC/MSD system as described in EPA Method TO-14. The heavy hydrocarbons are analyzed by passing a 100 to 1000 ml sample through a Nafion dryer into the 8" glass bead freezeout loop immersed in liquid oxygen. The components are desorbed into a fused silica cryofocussing loop with 80 C hot water. They are then desorbed from the cryofocus loop and the components are separated using a 30-meter DB-5 fused silica capillary column. The column is programmed from -20 C to 200 C at 3 C/min. Total analysis time is 60 minutes The method detection limit for this method is about 0.1 ppbv for most compounds and the precise analysis at 10 ppbvC is 5 percent. The compounds are detected on a FID set to operate at high sensitivity. Chromatograms are integrated using an HP 3393A computing integrator and stored on a HP 9114 disk drive for reintegration or further examination if required at a later date. Compounds are calibrated using an NBStraceable propane/hexane/ benzene standard. On the FID, hydrocarbons have a uniform response based on the number of carbon atoms. Data from the integrator is entered into the LOTUS 1-2-3 spreadsheet to generate the final report.

EPA TO-14 Chlorinated hydrocarbon by GC/ECD/PID

The chlorinated hydrocarbons are analyzed using an HP 5890 gas chromatograph with a fused silica capillary column using EPA Method To-14. Major components that cannot be identified using the ECD can be confirmed on an HP 5890/5970 GC/MSD system as described in EPA Method TO-14 for Full Scan The samples are analyzed by passing a 10 to 500 ml sample through a Nafion dryer into the 8" glass bead freezeout loop immersed in liquid oxygen. The components are desorbed into a fused silica cryofocussing loop with 80 C hot water. They are then desorbed from the cryofocus loop and the components are separated using a 30-meter DB-5 fused silica capillary column. The column is programmed from -20 C to 200 C at 3 C/min. Total analysis time is 30 minutes The method detection limit for this method varies from 1 pptv to about 500 pptv depending on the number and type of halogen atoms on the compound the RAD at 200 pptv is 5 Vinyl chloride and methyl chloride cannot be measured by this method. Chromatograms are integrated using an HP 3393A computing integrator and stored on a HP 9114 disk drive for reintegration or further examination if required at a later date. Compounds are calibrated using an NBS-traceable standard. Data from the integrator is entered into the LOTUS 1-2-3 spreadsheet to generate the final report.

EPA TO-14 Ambient Air by GC/MS Full Scan

The GC/MS method (EPA Method TO-14) uses a cryotrapping system and a high resolution capillary column to analyze for volatile organic compounds. Samples are collected in SUMMA canisters or Tedlar bags.

Samples are analyzed on an HP 5890 gas chromatograph and HP 5970 MSD quadrapole mass spectrometer detector. 500 to 1000 mL ambient air sample introduced from the air sampling container through a Nafion dryer to the freezeout loop. The freezeout loop is immersed in liquid oxygen and concentrates the air sample. After the sample is loaded, it is cryofocussed onto the beginning of a 30 meter fused silica capillary column. The cryofocused loop is then warmed and the compounds are separated and enter the mass spectrometer. The MS is scanned from 45 to 300 amu sith a scan rate of 1 to 2 seconds. The GC/MS has a complete data system capable of collecting, storing, and interpreting the data collected. The GC/MS is tuned and operated according to the specifications outlined in EPA SW 846 Test Methods. Compounds are calibrated by the external standard procedure using a NBS traceable Scott-Marrin air standards. relative standard deviation of the method is 15% at 5 ppbv and the MDL is 0.5 ppbv for most compounds.

5.5 Calibration Standards

There are two types of calibration standards used by EAS. The standards used for the Standard EPA TO-14 analytical tests are commercial NBS traceable gas standards nornally ordered at a concentration of 5 ppbv in AL150 cylinders. Special in-house standards are prepared for special projects where commercial standards are not available and for determining the retention times for many of the individual hydrocarbons.

5.5.1 Quantitative Standards

The concentrations of the individual compounds are determined by using an External Calibration procedure, in which the compound's response is compared to the response of a standard. The primary calibration standard is an NIST traceable reference gas standard obtained from Scott-Marrin, Inc., Riverside, CA. The standard cylinder is returned

every year for recertification by the manufacturer. EAS maintains cylinders with standards for all of the EPA VOC and TO-14 target compounds.

6. QUALITY ASSURANCE AND QUALITY CONTROL

6.1 Quality Assurance Administration

The quality assurance program at Environmental Analytical Service, Inc. is under the supervision of the Quality Assurance Supervisor (Section 2.2.2). He is responsible for implementing the procedures described in this manual, and for the quarterly Quality Assurance review. Each person in the laboratory has assigned QA duties that they are responsible for on a daily and weekly basis along with a monthly Quality Assurance Audit, which is a day each month set aside for extensive checks and calibrations of the various instruments used for sampling and analysis. The following sections describe specific QA procedures for various aspects of the laboratory operation.

6.2 Method Validation

Each of the analytical procedures described in Section 5 was developed according to approved procedures established by the EPA, CARB, or SCAQMD. Once the equipment and the standard operating procedures have been established the following method validation procedures are performed.

6.2.1 Compound Identification

The substances of interest in the chromatograms are identified by analyzing qualitative standards prepared from the pure materials. The results of these identifications are checked against the results of other laboratories run on similar columns. From this information at list of retention times for the standard operating parameters is prepared. A quality assurance standard is collected or prepared that has the desired compounds at proportions present in representative samples. This QA standard is analyzed at periodic intervals to check the peak assignments.

6.2.2 Initial Calibration

The linearity of the procedure is established by running a five point initial calibration curve. The response factors are calculated for each calibration point. The linear rance is considered the region where the response factors do not vary fore then 20%. The daily calibration is checked against the initial calibration curve and if the deviation of the daily calibration is more then 15% from the initial calibration the initial calibration curve is redone before the samples are analyzed.

6.2.3 Minimum Detectable Level (Detection Limit)

The minimum detectable level (MDL) is the lowest concentration of a substance that can be measured with confidence. The MDL is calculated at the 99% confidence level from eight repetitive measurements on a sample whose concentration does not exceed 10 times the estimated MDL (Glaser et. al. 1981; Long and Wincfordner, 1983). To calculate the MDL a sample is prepared in the appropriate matrix with components near the estimated MDL which is about 3 times the instrument noise level. This sample is run eight consecutive times and the standard deviation (S) is calculated. The MDL is determined using the following formula.

MDL = 3.0*S

The 95% confidence limits derived from the chi square distribution can be calculated using the equations below.

LCL = 0.69*MDL

UCL = 1.92*MDL

6.2.4 Relative Standard Deviation (RSD)

The relative standard deviation for the analytical method is calculated from repetitive runs on an actual air sample representative of the types of samples that will be analyzed. The RSD provides information on the precision or reproducibility of the actual measurement process. The RSD is calculated for a particular compound from the mean (x) and standard deviation (S) of five consecutive measurements using the following equation:

$$RSD (%) = \underline{S} * 100$$

The RSD is reported as a percentage deviation at a particular concentration.

6.2.5 Accuracy, Interlaboratory Comparisons

Duplicate samples and intercalibration samples are analyzed on a regular basis usually for project specific QA programs. For many EPA SAS projects EAS will analyze blind performance samples which are checked by RTI for EPA. If results do not agree within 20%, the analysis and calculations are checked to determine the source of the difference before additional samples are analyzed.

6.3 Instrument Calibration and Maintenance

The following quality assurance procedures are used to check each instrumental parameter that would affect the accuracy of the analytical data.

6.3.1 Calibration Standards

The concentrations of the individual compounds are determined by using NIST traceable reference gas standards obtained from Scott-Marrin, Inc., or Scott Specialaty Gases. Both manufacturers have over 10 years experience in blending gas standards. The standard cylinder is returned every year for recertification by the manufacturer. EAS maintains cylinders with standards for most of the EPA VOC and TO-14 target compounds.

For the semi-volatile organic compounds commercial liquid standards are used. These are purchased in sealed ampules from Supelco, Inc. or Ultra Scienfific. The concentrations of these components are certified by the manufacturer. These standards are used directly or with a 1:10 diltution.

6.3.2 Standard Dilution System

The standard dilution system on the gas chromatograph for diluting the 5 ppbv gas standards to the working level is calibrated gravimetrically by measuring the mass of water held by the sample loop and calculating the volume from the density of the water at the measurement temperature. This value is compared to the value supplied by the manufacturer of the loop.

6.3.3 Sample Volume Measurement and Calibration

The volume of air sampled is determined by transferring the air through the freezeout loop into an evacuated canister of known volume (1.7L). The pressure drop in the canister is measured using a precision vacuum gauge with an accuracy of 0.25%. From the pressure drop the volume of air at 25 C can be determined.

The volume of the canister is determined by weighing it empty, filling it with water, then reweighing it to get the mass of the water. The mass of water can be used to calculate the volume using the density of water. For ambient air samples the amount of material trapped out in the freezeout loop is small and can be neglected in the volume calculation (this is not always true for source samples which are run using a sampling loop). Water is removed using a Nafion dryer so the results are reported as dry air. The estimated overall uncertainty of the sample volume measurement system is about 2%.

The calculated volume is checked by using a calibrated 100 mL syringe to determine the pressure change corresponding to 100 mL, 200 mL, 300 mL, and 500 mL using successive volumes of zero air. This process is repeated three times to determine the average pressure drop corresponding to 500 mL and to check the linearity of the volume measuring system.

6.4 Quality Control Charts

6.4.1 Control Charts for Range

The EPA recommended quality control chart is maintained for each of the analytical methods. The chart is shown in Figure 6.5.a-b. Selected compounds in each of the analytical procedures are plotted using the data collected for a duplicate pair of samples which are run at least once a day. The control charts are prepared initially by calculating the range in 10 duplicate runs.

From this data the average range (R) is determined. The control limits are determined from the following formula (EPA, QA Handbook $\pi \ge H-10$).

UCL = 3.3 * R

UWL = 2.5 * R

LWL = 0

Range cannot be less than 0

LCL = 0

As duplicate data is collected the value of the average range is updated with the current information.

6.4.2 Control Charts for Averages

The control chart for average values are plotted for stable compounds which can be used to prepare a standard reference sample. To start the chart, the check sample is run in duplicate 10 times over a period of several days. From the duplicate runs the average value for each pair is calculated and the average of the averages (X) determined. The control limits are calculated using the following equations.

UCL = X + 1.88 * R

LCL = X - 1.88 *R

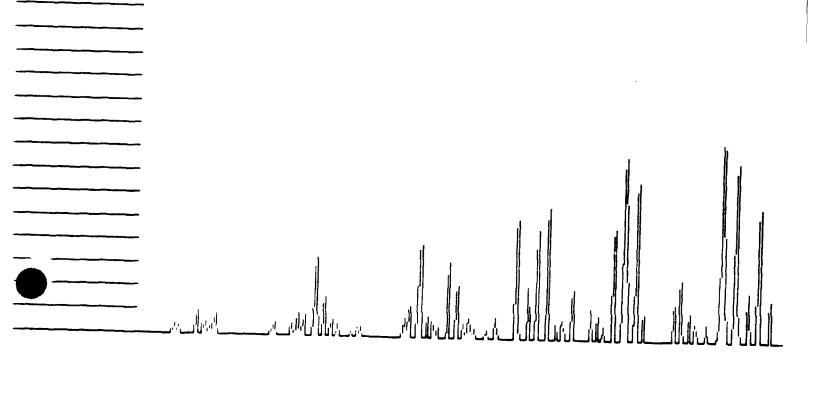
UWL = X + 1.25 *R

SECTION III CSL DATA



Environmental Analytical Service

ANALYTICAL REPORT
Section 2
McClellan AFB
Close Support Laboratory
March 20 - April 12, 1991



ANALYTICAL REPORT

Section 2
McClellan AFB
Close Support Laboratory
March 20 - April 12, 1991

Prepared for:

CH₂M Hill

Prepared by:

Steven D. Hoyt, Ph.D.

ENVIRONMENTAL ANALYTICAL SERVICE, INC. 170 Granada, Suite C San Luis Obispo, California 93401 Phone (805) 541-3666 FAX (805) 541-4550

SECTION 2

4.0 Analytical Results

The analytical results for the Close Support Laboratory (CSL) are tabulated by day analyzed in the following subsections.

For the quality assurance report for the data set refer to the material in Section 1 of the complete report.

ANALYTICAL RESULTS
March 20, 1991

VOLATILE ORGANIC COMPOUND ANALYSIS REPORT Close Support Laboratory, McClellan AFB

EPA Method TO-14: GC MS Full Scan

 Client: CH2M Hill
 Lab ≠: 3001

 Site: MW-AC-C-001
 Date Sampled: 3-20-91

 Can ≠: P-1
 Date Analyzed: 3-20-91

Concentration Concentration ppbv ug/m3 MDL Compound ppbv 7.50 7.50 7.50 30 150 Freon 12 Vinyl Chloride
Freon 11 7.50
1.1-Dichloroethene 7.50
Dichloromethane 7.50
Trichlorotrifluoroethane 7.50
1.1-Dichloroethane 7.50
c-1,2-Dichloroethene 7.50
t-1,2-Dichloroethene 7.50
7.50
7.50 not detected not detected 72 410 880 79 B 3500 270 B 30000 3900 not detected 7.50 7.50 1.1.1-Trichloroethane 1,2-Dichloroethane 7.50 7.50 7.50 7.50 7.50 7.50 Carbon Tetrachloride Trichloroethene Toluene Tetrach loroethene not detected

B - This compound is present in the daily instrument blank.

VOLATILE ORGANIC COMPOUND ANALYSIS REPORT Close Support Laboratory, McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 3002
Site: MW-AC-C-002 Date Sampled: 3-20-91
Can #: P-2 Date Analyzed: 3-20-91

Can *: P-2		Date Anal	yzed: 3-20-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12 Vinyl Chloride Freon 11 1,1-Dichloroethene Dichloromethane Trichlorotrifluoroethane 1,1-Dichloroethane c-1,2-Dichloroethene t-1,2-Dichloroethene Chloroform 1,1,1-Trichloroethane 1,2-Dichloroethane Benzene	7.50 7.50 7.50 7.50 7.50 7.50 7.50 7.50	not detected 100 1100 150 B 4300 not detected	220 not detected 560 4600 530 B 33000 not detected
Carbon Tetrachloride Trichloroethene Toluene Tetrachloroethene	7.50 7.50 7.50 7.50	7.6 not detected not detected not detected	48 not detected not detected not detected

o - This compound is present in the daily instrument blank.

VOLATILE ORGANIC COMPOUND ANALYSIS REPORT Close Support Laboratory. McClellan AFB

EPA Method TO-14: 30 MS Full Scan

 Client: CH2M Hill
 Lab #: 3005

 Site: MW-AC-C-007
 Date Sampled: 3-20-91

 Can ≠: P-5
 Date Analyzed: 3-20-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoroethane 1.1-Dichloroethane c-1.2-Dichloroethene t-1.2-Dichloroethene Chloroform 1.1.1-Trichloroethane 1.2-Dichloroethane Benzene Carbon Tetrachloride Trichloroethene Toluene	7.50 7.50 7.50 7.50 7.50 7.50 7.50 7.50	120 not detected 270 2500 not detected	580 not detected 1500 10000 not detected 130 110 not detected
Tetrachloroethene	7.50	not detected	not detected

JOLATILE ORGANIC COMPOUND ANALYSIS REPORT Close Support Laboratory, McClellan AFB

EPA Method TO-14: GC/MS Full Scan

 Client: CH2M Hill
 Lab #: 3000

 Site: MW-AC-C-019
 Date Sampled: 3-20-91

 Can ≠: P-10
 Date Analyzed: 3-20-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12 Vinyl Chloride Freon 11 1,1-Dichloroethene Dichloromethane Trichlorotriflouroethane151 1,1-Dichloroethane c-1,2-Dichloroethene t-1,2-Dichloroethene Chloroform 1,1,1-Trichloroethane Benzene	0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75	not detected not detected not detected not detected 5.9 B not detected	
Carbon Tetrachloride 117 Trichloroethene Toluene Tetrachlornethene	0.75 0.75 0.75 0.75	no detected r detected detected not detected	not detec not detec not detec not detec

B - This compound is present in the daily instrument blank.

ANALYTICAL RESULTS
March 26, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-013
Cperator	Hoyt		Lab #:	3007A2.D
Volume		200 ml	Date Ana	03/26/91

T	Canister	Initial:	800 Final:	936

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.3
Freon-11	0.75	129.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.1
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	3.5
1,2-Dichloroethane	0.75	0.2
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	23.2
Trichloroethene	0.75	20.2
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-013
Operator	Hoyt		Lab #:	3007A1.D
Volume		200 ml	Date Ana	03/26/91

Canister	Initial:	800 Final:	936

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.5
Freon-11	0.75	302.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	21.8
Toluene	0.75	0.6
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-AC-C-003
Operator Hoyt Lab #: 3003A2.D
Volume 200 ml Date Ana 03/26/91

Canister	Initial:	800 Final:	1044

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.3
Vinyl Chloride	0.75	0.3
Freon-11	0.75	150.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichlorcethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.5
1,2-Dichloroethane	0.75	0.2
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	23.8
Trichloroethene	0.75	21.4
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.3

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San Luis Obispo, CA 93401

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-008
Operator	Hoyt	Lab #:	3004A1.D
Volume	200 ml	Date Ana	03/26/91

Canister	Initial:	800 Final:	963

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.3
Vinyl Chloride	0.75	0.0
Freon-11	0.75	129.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.2
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.4
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	23.1
Trichloroethene	0.75	20.5
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TC-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-3-2
Cperator	Hoyt		Lab #:	3016A1.D
Volume		200 ml	Date Ana	03/26/91

Canister	Initial:	698 Final:	975
4			

Compound	MDL Concentration ppbv	
Freon-12	0.75	0.1
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.1
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	8.6
Trichloroethene	0.75	12.0
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-009
Operator	Hoyt		Lab #:	3006A1.D
Volume		200 ml	Date Ana	03/26/91

Canister	Initial:	80	O Final:	908
Compound		MDL	Concentration	l l

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.2
Freon-11	0.75	201.2 P
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.2
1,2-Dichloroethane	0.75	0.2
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	21.2
Trichloroethene	0.75	19.9
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.3

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P - Poor Peak Shape

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-015
Operator	Hoyt		Lab #:	3009A1.D
Volume		200 ml	Date Ana	03/26/91

Canister	Initial:	800 Final:	963

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.2
Freon-11	0.75	13.5 P
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	3.0
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	20.2
Trichloroethene	0.75	18.3
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.2

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P - Poor Peak Shape

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location MW-AC-C-014
Operator	Hoyt		Lab #: 3008A1.D
Volume		200 ml	Date Ana 03/26/91

Canister	Initial:	800 Final:	909

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	259.1 P
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.0
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	22.2
Trichloroethene	0.75	19.2
Toluene	0.75	0.2
Tetrachloroethene	0.75	0.3

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P- Poor Peak Shape

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-1-3
Operator	Hoyt		Lab #:	3012A1.D
Volume		200 ml	Date Ana	03/26/91

:Canister	Initial:	705 Final:	986

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	21.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.1
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	1.8
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	14.4
Trichloroethene	0.75	12.8
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-DR-C-2-1
Operator Hoyt Lab #: 3013A1.D
Volume 200 ml Date Ana 03/26/91

Canister	P = 2 4 2 - 3		
luanister	Initial:	718 Final:	905
	****	, 10 t THGT.	9031

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	31.6
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	4.0
Chloroform	0.75	0.4
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	38.9
Trichloroethene	0.75	109.1
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-DR-C-1-1
Operator Hoyt Lab #: 3010A1.D
Volume 200 ml Date Ana 03/26/91

Canister	Initial:	694 Final:	986

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	81.9
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.1
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.6
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	4.2
Trichloroethene	0.75	3.4
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-2-2
Operator	Hoyt		Lab #:	3014A1.D
Volume		200 ml	Date Ana	03/26/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	35.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	3.1
Chloroform	0.75	0.4
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	30.3
Trichloroethene	0.75	84.1
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	ZERO AIR BLANK
Cperator	Hoyt		Lab #:	B03261A1.D
Volume		200 ml	Date Ana	03/26/91

	- 1 - 1	700 Final:	
Canictay	TM12121	700 Final:	7001
Canister	Initial:	, oo ranga.	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.1
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-3-3
Operator	Hoyt		Lab #:	3018A1.D
Volume		200 ml	Date Ana	03/26/91

Canister	Initial:	690 Final:	
Canterar	INITIAL	AUD ETMAIL	11 40
ILAIIIS LEL	1111 - 1 - 1 - 1	UJU FINAL.	963

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	0.9
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	5.8
Trichloroethene	0.75	7.9
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-2-3
Operator	Hoyt		Lab #:	3015 A 1.D
Volume		200 ml	Date Ana	03/26/91

Canister	Initial:	716 Final:	971

Compound	MDL	Concentration ppbv	
Freon-12	0.75	0.1	
Vinyl Chloride	0.75	0.0	
Freon-11	0.75	26.4	
c-1,2-Dichloroethene	0.75	0.0	
1,1-Dichloroethane	0.75	0.0	
t-1,2-Dichloroethene	0.75	4.3	
Chloroform	0.75	0.6	
1,1,1-Trichloroethane	0.75	0.1	
1,2-Dichloroethane	0.75	0.0	
Benzene	0.75	0.1	
Carbon Tetrachloride	0.75	43.3	
Trichloroethene	0.75	120.0	
Toluene	0.75	0.1	
Tetrachloroethene	0.75	0.1	

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-1-2
Operator	Hoyt		Lab #:	3011A1.D
Volume		200 ml	Date_Ana	03/26/91

Canister	Initial:	698 Final:	957

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	122.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.1
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	1.6
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	12.0
Trichloroethene	0.75	10.3
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.1

ANALYTICAL RESULTS March 27, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	mw-pc-c-2-b
Operator	Hoyt		Lab #:	3020A2.D
Volume		200 ml	Date Ana	03/27/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	26.9
1,1-Dichloroethane	0.75	0.0
1,2-Dichloroethene	0.75	3.3
Chloroform	0.75	0.4
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	1.9
Carbon Tetrachloride	0.75	26.0
Trichloroethene	0.75	83.8
Toluene	0.75	1.2
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location MW-	PC-C-2-3
Operator	Hoyt	Lab #: 302	23A1.D
Volume	200 ml	Date Ana 03	/27/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	38.5
1,1-Dichloroethane	0.75	0.0
1,2-Dichloroethene	0.75	3.4
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	2.3
Carbon Tetrachloride	0.75	28.2
Trichloroethene	0.75	90.8
Toluene	0.75	1.6
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	mw-pc-c-2-b
Operator	Hoyt		Lab #:	3019 A 1.D
Volume		200 ml	Date Ana	03/27/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
1,1-Dichloroethane	0.75	0.0
1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.0
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-PC-C-2-2
Operator	Hoyt	Lab #:	3021A1.D
Volume	200 ml	Date Ana	03/27/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	33.3
1,1-Dichloroethane	0.75	0.2
1,2-Dichloroethene	0.75	5.8
Chloroform	0.75	0.8
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.6
Carbon Tetrachloride	0.75	50.2
Trichloroethene	0.75	151.0
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-PC-C-2-2-DUPLI
Operator Hoyt Lab #: 3022A2.D
Volume 200 ml Date Ana 03/27/91

Canister Initial: 700 Final: 700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.2
Freon-11	0.75	36.0
1,1-Dichloroethane	0.75	0.2
1,2-Dichloroethene	0.75	7.7
Chloroform	0.75	0.8
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	59.5
Trichloroethene	0.75	182.0
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.2

VOLATILE ORGANIC COMPOUND ANALYSIS REPORT Close Support Laboratory, McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Lab #: 3019
Date Sampled: 3-27-91
Date Analyzed: 3-27-91 Client: CH2M Hill Site: MW-PC-C-2-B Can ≠:

Compound	MDL ppbv	Concentration ppbv	Concentration Flag ug/m3
Freon 12	0.75	nd	nd
Vinyl Chloride	0.75	nd	nd
Freon 11	0.75	nd	nd
1.1-Dichloroethene	0.75	NM	NM NM
Dichloromethane	0.75	NM	NM NM
Trichlorotrifluoroethane	0.75	NM	NM NM
1,1-Dichloroethane	0.75	nd	nd
c-1,2-Dichloroethene	0.75	nd	nd
t-1,2-Dichloroethene	0.75	nd	· nd
Chloroform	0.75	nd	nd
1.1.1-Trichloroethane	0.75	nd	nd
1,2-Dichloroethane	0.75	nd	nd
Benzene	0.75	nd	nd
Carbon Tetrachloride	0.75	nd	nd
Trichloroethene	0.75	nď	nd
Toluene	0.75	nd	nd
Tetrachloroethene	0.75	nd	nd

Data Flags:

B - Compound Present in Daily Blank NM - Not Measured on this Analysis

ANALYTICAL RESULTS March 29, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TC-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-3-B
Operator	STEVE HOYT	Lab #:	S3027A1.D
Volume	200 ml	Date Ana	03/29/91

Canister I	nister Initial:		700 Final:	
Compound		MDL	Concentration ppbv	
Freon-12		0.75	0.0	
Vinyl Chloride		0.75	0.2	
Freon-11		0.75	0.0	
c-1,2-Dichloroethen	e	0.75	0.0	
1,1-Dichloroethane		0.75	0.1	
t-1,2-Dichloroethen	e	0.75	0.0	
Chloroform		0.75	0.0	
1,1,1-Trichloroetha	ne	0.75	0.0	
1,2-Dichloroethane		0.75	0.0	
Benzene		0.75	0.0	
Carbon Tetrachlorid	le	0.75	0.0	

0.75

0.75

0.75

0.0

0.0

0.0

Environmental Analytical Service 170 Granada, Suite C San Luis Obispo, CA 93401

Trichloroethene

Tetrachloroethene

Toluene

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-3-3
Operator	STEVE HOYT	Lab #:	S3026.D
Volume	200 ml	Date Ana	03/29/91

Canister	Initial:	700 Final:	700
Cantacer	1111-01-01	, 00 1 211 221	, 00

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.3
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	2.8
Trichloroethene	0.75	4.4
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-3-2
Cperator	STEVE HOYT	Lab #:	S3025A1.D
Volume	200 ml	Date Ana	03/29/91

0		MDT	Concentrat	
Canister	Initial:	70	O Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.5
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.1
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	5.8
Trichloroethene	0.75	9.2
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-3-1
Operator	STEVE HOYT	Lab #:	S3024A1.D
Volume	200 ml	Date Ana	03/29/91

0 :	T-1-1-1-	700 Final:	700
Canister	Initial:	/UU Pinai:	7001
,			

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	4.8
Trichloroethene	0.75	7.9
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-1
Operator	STEVE HOYT	Lab #:	S3028.D
Volume	200 ml	Date Ana	03/29/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	234.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.2
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	2.7
1,2-Dichloroethane	0.75	0.2
Benzene	0.75	0.4
Carbon Tetrachloride	0.75	14.1
Trichloroethene	0.75	13.6
Toluene	0.75	0.5
Tetrachloroethene	0.75	0.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-3-3
Operator	STEVE HOYT	Lab #:	S3026.D
Volume	200 ml	Date Ana	03/29/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.3
Freon-11	0.75	01
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	2.8
Trichloroethene	0.75	4.4
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.1

ANALYTICAL RESULTS April 1, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location ZERO AIR BLANK
Operator RUTH Lab #: B04011A1.D
Volume 200 ml Date Ana 04/01/91

Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.0
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-DR-C-9-3
Operator MILLER Lab #: 3037A1.D
Volume 200 ml Date Ana 04/01/91

Canister Initial: 700 Final: 700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.1
Vinyl Chloride	0.75	0.2
Freon-11	0.75	69.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.9
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.6
1,1,1-Trichloroethane	0.75	23.6
1,2-Dichloroethane	0.75	1.3
Benzene	0.75	0.3
Carbon Tetrachloride	0.75	0.7
Trichloroethene	0.75	30.5
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-7-2
Operator	MILLER	Lab #:	3030B2.D
Volume	10 ml	Date Ana	04/01/91

Canister	Initial:	681 Final:	982

Compound	MDL	Concentration ppbv
Freon-12	15.00	0.6
Vinyl Chloride	15.00	0.0
Freon-11	15.00	385.2
c-1,2-Dichloroethene	15.00	0.0
1,1-Dichloroethane	15.00	4334.7
t-1,2-Dichloroethene	15.00	5158.2
Chloroform	15.00	53.4
1,1,1-Trichloroethane	15.00	334.0
1,2-Dichloroethane	15.00	731.4
Benzene	15.00	276.5
Carbon Tetrachloride	15.00	1.5
Trichloroethene	15.00	2168.5
Toluene	15.00	6.8
Tetrachloroethene	15.00	233.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-7-2
Operator	MILLER	Lab #:	3030B1.D
Volume	10 ml	Date Ana	04/01/91

Canister	Initial:	681 Final:	982

Compound	MDL	Concentration ppbv
Freon-12	15.00	0.0
Vinyl Chloride	15.00	0.0
Freon-11	15.00	0.0
c-1,2-Dichloroethene	15.00	0.0
1,1-Dichloroethane	15.00	5157.0
t-1,2-Dichloroethene	15.00	5571.6
Chloroform	15.00	64.4
1,1,1-Trichloroethane	15.00	377.5
1,2-Dichloroethane	15.00	827.0
Benzene	15.00	313.8
Carbon Tetrachloride	15.00	2.1
Trichloroethene	15.00	3050.1
Toluene	15.00	8.5
Tetrachloroethene	15.00	271.6

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-DR-C-9-1
Operator MILLER Lab #: 3035B1.D
Volume 200 ml Date Ana 04/02/91

1 A	Initial:	700 Final:	300
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Canister	1111 C1G1 .	, oo i indi.	, , ,

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	63.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1.2
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.6
1,1,1-Trichloroethane	0.75	17.4
1,2-Dichloroethane	0.75	0.9
Benzene	0.75	0.3
Carbon Tetrachloride	0.75	0.6
Trichloroethene	0.75	29.3
Toluene	0.75	0.1
Tetrachloroethene	0.75	1.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-9-2 P-3
Operator	MILLER	Lab #:	3036B1.D
Volume	140 ml	Date Ana	04/02/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.07	0.0
Vinyl Chloride	1.07	0.0
Freon-11	1.07	47.1
c-1,2-Dichloroethene	1.07	0.0
1,1-Dichloroethane	1.07	1.0
t-1,2-Dichloroethene	1.07	0.1
Chloroform	1.07	0.5
1,1,1-Trichloroethane	1.07	21.5
1,2-Dichloroethane	1.07	1.3
Benzene	1.07	0.3
Carbon Tetrachloride	1.07	0.6
Trichloroethene	1.07	35.1
Toluene	1.07	0.0
Tetrachloroethene	1.07	2.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-DR-C-7-1 P-39
Operator MILLER Lab #: 3029A1.D
Volume 195 ml Date Ana 04/02/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.77	0.0
Vinyl Chloride	0.77	0.0
Freon-11	0.77	263.2
c-1,2-Dichloroethene	0.77	0.0
1,1-Dichloroethane	0.77	7374.8
t-1,2-Dichloroethene	0.77	10411.6
Chloroform	0.77	45.7
1,1,1-Trichloroethane	0.77	409.9
1,2-Dichloroethane	0.77	854.3
Benzene	0.77	291.0
Carbon Tetrachloride	0.77	0.0
Trichloroethene	0.77	6001.7
Toluene	0.77	0.0
Tetrachloroethene	0.77	86.5

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-7-3 P-44
Operator	MILLER	Lab #:	3031A1.D
Volume	95 ml	Date Ana	04/02/91

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— • • • • • • • • • • • • • • • • • • •	Initial:	700 Final:	700
Canister	iniriai:	/(() Final:	700
Cantacer	****	, 00 * +11	, 001

Compound	MDL	Concentration ppbv
Freon-12	1.58	0.0
Vinyl Chloride	1.58	0.0
Freon-11	1.58	224.2
c-1,2-Dichloroethene	1.58	0.0
1,1-Dichloroethane	1.58	1707.5
t-1,2-Dichloroethene	1.58	2190.0
Chloroform	1.58	22.5
1,1,1-Trichloroethane	1.58	148.9
1,2-Dichloroethane	1.58	304.9
Benzene	1.58	119.7
Carbon Tetrachloride	1.58.	0.5
Trichloroethene	1.58	652.9
Toluene	1.58	1.5
Tetrachloroethene	1.58	44.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-8-3 P-43
Operator	MILLER	Lab #:	3034A1.D
Volume	180 ml	Date Ana	04/02/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration
		ppbv
Freon-12	0.83	0.0
Vinyl Chloride	0.83	0.0
Freon-11	0.83	103.9
c-1,2-Dichloroethene	0.83	0.0
1,1-Dichloroethane	0.83	81.2
t-1,2-Dichloroethene	0.83	14.3
Chloroform	0.83	3.7
1,1,1-Trichloroethane	0.83	225.9
1,2-Dichloroethane	0.83	14.4
Benzene	0.83	4.4
Carbon Tetrachloride	0.83	2.2
Trichloroethene	0.83	246.2
Toluene	0.83	0.2
Tetrachloroethene	0.83_	25.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-8-2 P-49
Operator	MILLER	Lab #:	3033A1.D
Volume	137 ml	Date Ana	04/02/91

CasiceAV	TRIPIAL	700 61931	7001
Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.09	0.1
Vinyl Chloride	1.09	0.5
Freon-11	1.09	399.2
c-1,2-Dichloroethene	1.09	0.0
1,1-Dichloroethane	1.09	173.4
t-1,2-Dichloroethene	1.09	24.9
Chloroform	1.09	8.1
1,1,1-Trichloroethane	1.09	365.8
1,2-Dichloroethane	1.09	22.9
Benzene	1.09	6.6
Carbon Tetrachloride	1.09	3.4
Trichloroethene	1.09	976.2
Toluene	1.09	0.0
Tetrachloroethene '	1.09	13.6

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-8-1 P-48
Operator	MILLER	Lab #:	3032 A 1.D
Volume	200 ml	Date Ana	04/02/91

Canister	Initial:	700 Final:	7001
(Cantzrer	T11T (TGT *	\OO LIHGI.	/ 00 [

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	184.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	75.8
t-1,2-Dichloroethene	0.75	8.1
Chloroform	0.75	4.0
1,1,1-Trichloroethane	0.75	176.7
1,2-Dichloroethane	0.75	10.8
Benzene	0.75	3.4
Carbon Tetrachloride	0.75	1.9
Trichloroethene	0.75	141.6
Toluene	0.75	0.1
Tetrachloroethene	0.75	14.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Canister

			ڪر
Client:	CH2M HILL	Location	MW-DR-C-7-1 P-27
Operator	MILLER	Lab #:	3032A9.D
Volume	180 ml	Date Ana	04/02/91

Initial: 700 Final:

700

Compound	MDL	Concentration ppbv
Freon-12	0.83	4.1
Vinyl Chloride	0.83	0.0
Freon-11	0.83	618.4
c-1,2-Dichloroethene	0.83	0.0
1,1-Dichloroethane	0.83	7690.2
t-1,2-Dichloroethene	0.83	4116.7
Chloroform	0.83	48.7
1,1,1-Trichloroethane	0.83	268.7
1,2-Dichloroethane	0.83	508.3
Benzene	0.83	202.6
Carbon Tetrachloride	0.83	0.0
Trichloroethene	0.83	2166.1
Toluene	0.83	3.9

0.83

100.8

Environmental Analytical Service 170 Granada, Suite C San Luis Obispo, CA 93401

Tetrachloroethene

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-AC-C-7-1 P-42
Operator MILLER Lab #: 3038A1.D
Volume 200 ml Date Ana 04/02/91

1	Initial:	662 Final:	
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Canister	**************************************	OUZ I INGI.	10101

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	875.5
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	16470.6
t-1,2-Dichloroethene	0.75	8457.4
Chloroform	0.75	99.8
1,1,1-Trichloroethane	0.75	606.3
1,2-Dichloroethane	0.75	1278.1
Benzene	0.75	512.7
Carbon Tetrachloride	0.75	3.8
Trichloroethene	0.75	6367.0
Toluene	0.75	11.2
Tetrachloroethene	0.75	255.6

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-7-3 P-32
Operator	MILLER	Lab #:	3040A1.D
Volume	158.5 ml	Date Ana	04/02/91

Canister	Initial:	700 Final:	700
•			

Compound	MDL	Concentration ppbv
Freon-12	0.95	0.0
Vinyl Chloride	0.95	0.0
Freon-11	0.95	617.2
c-1,2-Dichloroethene	0.95	0.0
1,1-Dichloroethane	0.95	8113.4
t-1,2-Dichloroethene	0.95	5343.0
Chloroform	0.95	48.7
1,1,1-Trichloroethane	0.95	290.8
1,2-Dichloroethane	0.95	606.9
Benzene	0.95	236.2
Carbon Tetrachloride	0.95	0.0
Trichloroethene	0.95	22048.7
Toluene	0.95	5.1
Tetrachloroethene	0.95	88.4

ANALYTICAL RESULTS April 2, 1991

ANALYTICAL RESULIS
April 4, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-9-B P-65
Operator	MILLER	Lab #:	3057A1.D
Volume	200 ml	Date Ana	04/04/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.1
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-9-3 P-64
Operator	MILLER	Lab #:	3055A1.D
Volume	137 ml	Date Ana	04/04/91

Canister	Initial:	70	O Final:	700
Compound		MDI.	Concentration	

Compound	MDL	Concentration ppbv
Freon-12	1.09	0.1
Vinyl Chloride	1.09	0.3
Freon-11	1.09	45.0
c-1,2-Dichloroethene	1.09	0.0
1,1-Dichloroethane	1.09	1.0
t-1,2-Dichloroethene	1.09	0.0
Chloroform	1.09	0.4
1,1,1-Trichloroethane	1.09	13.9
1,2-Dichloroethane	1.09	0.7
Benzene	1.09	0.3
Carbon Tetrachloride	1.09	0.4
Trichloroethene	1.09	28.4
Toluene	1.09	0.1
Tetrachloroethene	1.09	1.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-AC-C-9-4 P-63
Operator MILLER Lab #: 3056A1.D
Volume 200 ml Date Ana 04/04/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	58.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1.2
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	14.3
1,2-Dichloroethane	0.75	0.7
Benzene	0.75	0.3
Carbon Tetrachloride	0.75	0.4
Trichloroethene	0.75	26.8
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.7

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-9-2 P-57
Operator	MILLER	Lab #:	3054A1.D
Volume	158.5 ml	Date Ana	04/04/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.95	0.0
Vinyl Chloride	0.95	0.0
Freon-11	0.95	38.5
c-1,2-Dichloroethene	0.95	0.0
1,1-Dichloroethane	0.95	0.9
t-1,2-Dichloroethene	0.95	0.1
Chloroform	0.95	0.3
1,1,1-Trichloroethane	0.95	14.5
1,2-Dichloroethane	0.95	0.8
Benzene	0.95	0.3
Carbon Tetrachloride	0.95	0.4
Trichloroethene	0.95	29.0
Toluene	0.95	0.1
Tetrachloroethene	0.95	1.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-9-1 P-58
Operator	MILLER	Lab #:	3053B1.D
Volume	21.6 ml	Date Ana	04/04/91

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Compound	MDL	Concentration ppbv
Freon-12	6.94	0.00
Vinyl Chloride	6.94	0.00
Freon-11	6.94	0.00
1,1-Dichloroethene	6.94	0.00
Freon-113	6.94	166.17
Dichloromethane	6.94	13.13
1,1-Dichloroethane	6.94	1.16
1,2-Dichloroethene	6.94	0.00
Chloroform	6.94	0.53
1,1,1-Trichloroethane	6.94	14.33
1,2-Dichloroethane	6.94	0.99
Benzene	6.94	0.24
Carbon Tetrachloride	6.94	0.82
Trichloroethene	6.94	26.62
Toluene	6.94	0.00
Tetrachloroethene	6.94	1.03

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-9-1 P-58
Operator	MILLER	Lab #:	3053A1.D
Volume	200 ml	Date Ana	04/04/91

Canister Initial:	653 Final:	1054

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	65.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1.3
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	19.4
1,2-Dichloroethane	0.75	1.0
Benzene	0.75	0.3
Carbon Tetrachloride	0.75	0.6
Trichloroethene	0.75	34.5
Toluene	0.75	0.1
Tetrachloroethene	0.75	1.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-2-2 P-19
Operator	MILLER	Lab #:	3014B1.D
Volume	21.6 ml	Date Ana	04/04/91

Canister	Initial:	716 Final:	953

Compound	MDL	Concentration ppbv
Freon-12	6.94	0.00
Vinyl Chloride	6.94	0.97
Freon-11	6.94	64.51
1,1-Dichloroethene	6.94	362.29
Freon-113	6.94	248.10
Dichloromethane	6.94	34.84
1,1-Dichloroethane	6.94	0.00
1,2-Dichloroethene	6.94	7.31
Chloroform	6.94	1.00
1,1,1-Trichloroethane	6.94	0.00
1,2-Dichloroethane	6.94	0.00
Benzene	6.94	0.29
Carbon Tetrachloride	6.94	46.85
Trichloroethene	6.94	175.94
Toluene	6.94	0.17
Tetrachloroethene	6.94	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-1-2
Operator	RUTH	Lab #:	3011B1.D
Volume	21.6 ml	Date Ana	04/04/91

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Canister	INITIALI	AUX FINAL!	9571
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Compound	MDL	Concentration ppbv
Freon-12	6.94	73.54
Vinyl Chloride	6.94	0.00
Freon-11	6.94	292.10
1,1-Dichloroethene	6.94	2310.55
Freon-113	6.94	548.09
Dichloromethane	6.94	41.82
1,1-Dichloroethane	6.94	0.06
1,2-Dichloroethene	6.94	1.44
Chloroform	6.94	0.79
1,1,1-Trichloroethane	6.94	3.28
1,2-Dichloroethane	6.94	1.14
Benzene	6.94	0.47
Carbon Tetrachloride	6.94	15.97
Trichloroethene	6.94	16.20
Toluene	6.94	0.80
Tetrachloroethene	6.94	0.85

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-008 P4
Operator	MILLER	Lab #:	3004B1.D
Volume	21.6 ml	Date Ana	04/04/91

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Canister	Initial:	700 Final:	
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Compound	MDL	Concentration ppbv
Freon-12	6.94	102.23
Vinyl Chloride	6.94	0.59
Freon-11	6.94	408.31
1,1-Dichloroethene	6.94	2509.68
Freon-113	6.94	824.55
Dichloromethane	6.94	62.42
1,1-Dichloroethane	6.94	0.48
1,2-Dichloroethene	6.94	0.80
Chloroform	6.94	0.00
1,1,1-Trichloroethane	6.94	3.90
1,2-Dichloroethane	6.94	0.00
Benzene	6.94	0.00
Carbon Tetrachloride	6.94	24.17
Trichloroethene	6.94	21.72
Toluene	6.94	0.00
Tetrachloroethene	6.94	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-009 P6
Operator	MILLER	Lab #:	3006B1.D
Volume	21.6 ml	Date Ana	04/04/91

0	T-1-1-1-1	700 5:1.	700
Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	6.94	0.00
Vinyl Chloride	6.94	0.00
Freon-11	6.94	468.26
1,1-Dichloroethene	6.94	2687.80
Freon-113	6.94	1840.74
Dichloromethane	6.94	149.54
1,1-Dichloroethane	6.94	0.58
1,2-Dichloroethene	6.94	0.00
Chloroform	6.94	0.00
1,1,1-Trichloroethane	6.94	4.16
1,2-Dichloroethane	6.94	0.00
Benzene	6.94	0.00
Carbon Tetrachloride	6.94	23.34
Trichloroethene	6.94	22.42
Toluene	6.94	0.00
Tetrachloroethene	6.94	0.56

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-5-1 P54
Operator	MILLER	Lab #:	3050A1.D
Volume	200 ml	Date Ana	04/04/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.5
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	5.7
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	0.5
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	1.6
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	10.5
Toluene	0.75	1.9
Tetrachloroethene	0. <u>75</u>	0.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-5-3 P52
Operator	MILLER	Lab #:	3052A1.D
Volume	200 ml	Date Ana	04/04/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.1
Vinyl Chloride	0.75	0.0
Freon-11	0.75	1.6
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1.5
t-1,2-Dichloroethene	0.75	69.4
Chloroform	0.75	0.7
1,1,1-Trichloroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.4
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	158.2
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.5

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-AC-C-5-2 P55
Operator MILLER Lab #: 3051A1.D
Volume 200 ml Date Ana 04/04/91

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Canister	Initial:	OWD FINAL.	1032

Compound	MDL Concentration ppbv	
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.8
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.9
t-1,2-Dichloroethene	0.75	48.5
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	0.3
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.5
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	116.5
Toluene	0.75	0.4
Tetrachloroethene	0.75	0.4

ANALYTICAL RESULTS April 3, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-8-B P51
Operator	MILLER	Lab #:	3049A1.D
Volume	200 ml	Date Ana	04/03/91

Canister	Initial:	70	O Final:	700
Compound		MDL	Concentrati ppbv	on

Compound	MDL Concentration ppbv	
Freon-12	0.75	0.1
Vinyl Chloride	0.75	0.1
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.0
1,1,1-Trichioroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	1.6
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-8-1 P26
Operator	MILLER	Lab #:	3046A1.D
Volume	160 ml	Date Ana	04/03/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.94	0.0
Vinyl Chloride	0.94	0.0
Freon-11	0.94	413.5
c-1,2-Dichloroethene	0.94	0.0
1,1-Dichloroethane	0.94	180.3
t-1,2-Dichloroethene	0.94	13.6
Chloroform	0.94	8.1
1,1,1-Trichloroethane	0.94	301.9
1,2-Dichloroethane	0.94	18.3
Benzene	0.94	6.1
Carbon Tetrachloride	0.94	3.4
Trichloroethene	0.94	1311.9
Toluene	0.94	0.4
Tetrachloroethene	0.94	30.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-8-2 P46
Operator	MILLER	Lab #:	3047A1.D
Volume	200 ml	Date Ana	04/03/91

Canister	Initial:	/U	O Final:	/00
		_		
//		MOT	Concentent	

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	274.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	110.8
t-1,2-Dichloroethene	0.75	8.6
Chloroform	0.75	5.3
1,1,1-Trichloroethane	0.75	208.5
1,2-Dichloroethane	0.75	13.4
Benzene	0.75	4.3
Carbon Tetrachloride	0.75	2.6
Trichloroethene	0.75	174.9
Toluene	0.75	0.7
Tetrachloroethene	0.75	24.7

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-DR-C-6-4 P-41
Operator MILLER Lab #: 3045A1.D
Volume 200 ml Date Ana 04/03/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	2.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	3.4
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	44.8
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-6-3	P-53
Operator	RUTH		Lab #:	3044A1.D	
Volume		200 ml	Date Ana	04/03/91	

Canister	Initial:	700 Final:	700
			

Compound	MDL	Concentration ppbv	
Freon-12	0.75	0.0	
Vinyl Chloride	0.75	0.0	
Freon-11	0.75	0.0	
c-1,2-Dichloroethene	0.75	0.0	
1,1-Dichloroethane	0.75	0.7	
t-1,2-Dichloroethene	0.75	1.6	
Chloroform	0.75	0.2	
1,1,1-Trichloroethane	0.75	0.2	
1,2-Dichloroethane	0.75	0.0	
Benzene	0.75	0.5	
Carbon Tetrachloride	0.75	0.0	
Trichloroethene	0.75	49.0	
Toluene	0.75	1.3	
Tetrachloroethene	0.75	0.3	

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-8-3 P-31
Operator	RUTH		Lab #:	3048A2.D
Volume		95 ml	Date Ana	04/03/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.58	0.0
Vinyl Chloride	1.58	0.0
Freon-11	1.58	249.9
c-1,2-Dichloroethene	1.58	0.0
1,1-Dichloroethane	1.58	129.5
t-1,2-Dichloroethene	1.58	10.4
Chloroform	1.58	6.5
1,1,1-Trichloroethane	1.58	238.5
1,2-Dichloroethane	1.58	14.9
Benzene	1.58	4.9
Carbon Tetrachloride	1.58	2.4
Trichloroethene	1.58	363.3
Toluene	1.58	0.3
Tetrachloroethene	1.58	32.7

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-7-B P-37
Operator	MILLER	Lab #:	3041A1.D
Volume	134 ml	Date Ana	04/03/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.12	0.4
Vinyl Chloride	1.12	0.0
Freon-11	1.12	0.2
c-1,2-Dichloroethene	1.12	0.0
1,1-Dichloroethane	1.12	1.0
t-1,2-Dichloroethene	1.12	1.1
Chloroform	1.12	0.0
1,1,1-Trichloroethane	1.12	0.4
1,2-Dichloroethane	1.12	0.3
Benzene	1.12	0.5
Carbon Tetrachloride	1.12	0.0
Trichloroethene	1.12	10.7
Toluene	1.12	2.3
Tetrachloroethene	1.12	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-6-1 P47
Operator	RUTH	Lab #:	3042A1.D
Volume	200 ml	Date Ana	04/03/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.3
t-1,2-Dichloroethene	0.75	4.1
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	46.4
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-6-2 P-46
Operator	RUTH		Lab #:	3043 A1. D
Volume		200 ml	Date Ana	04/03/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	3.7
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	42.5
Toluene	0.75	0.0
Tetrachloroethene	0.75	_0.2

ANALYTICAL RESULIS April 8, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-5-3 P-70
Operator	MILLER	Lab #:	3072B1.D
Volume	20 ml	Date Ana	04/08/91

Canister	Initial:	700 Final:	700i
Cantorer	THIT CIGI.	/OU TIMET.	, 00

Compound	MDL	Concentration ppbv
Freon-12	7.50	0.00
Vinyl Chloride	7.50	0.00
Freon-11	7.50	4.64
1,1-Dichloroethene	7.50	33.94
Freon-113	7.50	333.64
Dichloromethane	7.50	21.10
1,1-Dichloroethane	7.50	1.10
1,2-Dichloroethene	7.50	74.05
Chloroform	7.50	0.55
1,1,1-Trichloroethane	7.50	0.00
1,2-Dichloroethane	7.50	0.00
Benzene	7.50	0.45
Carbon Tetrachloride	7.50	0.00
Trichloroethene	7.50	160.55
Toluene	7.50	0.00
Tetrachloroethene	7.50	0.33

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-5-3 P-70
Operator	MILLER	Lab #:	3072A1.D
Volume	200 ml	Date Ana	04/08/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	1.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.7
t-1,2-Dichloroethene	0.75	49.9
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	0.1
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.3
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	115.9
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-AC-C-5-2 P-76
Operator MILLER Lab #: 3071A1.D
Volume 200 ml Date Ana 04/08/91

0 i	W-141-1.	700 511.	700
Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	0.5
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.6
t-1,2-Dichloroethene	0.75	46.1
Chloroform	0.75	0.4
1,1,1-Trichloroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.4
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	103.5
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-5-1	P-7
Operator	MILLER	Lab #:	3070A1.D	
Volume	200 ml	Date Ana	04/08/91	

0	Total	CTT Final.	1044
Canister	Initial:	677 Final:	10441

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.7
Freon-11	0.75	1.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.4
t-1,2-Dichloroethene	0.75	29.3
Chloroform	0.75	0.3
1,1,1-Trichloroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.5
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	64.8
Toluene	0.75	0.4
Tetrachloroethene	0.75	0.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-6-2
Operator	MILLER	Lab #:	3066A1.D
Volume	200 ml	Date Ana	04/08/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.8
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	4.3
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	59.3
Toluene	0.75	0.2
Tetrachloroethene	0.75	0.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-6-B
Operator	RUTH		Lab #:	3068A1.D
Volume		200 ml	Date Ana	04/08/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.1
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-6-1 P-61
Operator	RUTH		Lab #:	3065A1.D
Volume		200 ml	Date Ana	04/08/91

	T ! A ! - 1	200 5 1	700
Canister	Initial:	700 Final:	7001

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	3.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	3.9
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	0.2
1,2-Dichloroethane	0.75	0.1
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	56.5
Toluene	0.75	0.2
Tetrachloroethene	0.75	0.2

ANALYTICAL RESULTS April 5, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-31-3 P-68
Operator	MILLER	Lab #:	3063A2.D
Volume	200 ml	Date Ana	04/05/91

Canister	Initial:	544 Final:	1050
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	5.2
t-1,2-Dichloroethene	0.75	0.5
Chloroform	0.75	0.7
1,1,1-Trichloroethane	0.75	178.0
1,2-Dichloroethane	0.75	9.3
Benzene	0.75	0.9
Carbon Tetrachloride	0.75	0.2
Trichloroethene	0.75	52.7
Toluene	0.75	0.3
Tetrachloroethene	0.75	1.8

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-31-2 P-69
Operator MILLER Lab #: 3062A1.D
Volume 200 ml Date Ana 04/05/91

		700 Final:	700
Canister	Initial:	7/13/13 6/11/9/9/11	7011
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.6
t-1,2-Dichloroethene	0.75	0.4
Chloroform	0.75	0.4
1,1,1-Trichloroethane	0.75	126.9
1,2-Dichloroethane	0.75	6.5
Benzene	0.75	0.5
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	35.4
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.7

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	VR-AC-C-31-1 P-72
Operator	RUTH		Lab #:	3061A1.D
Volume		200 ml	Date Ana	04/05/91

Canister	Initial:	70	O Final:	700
	"			
Compound		MDL	Concentrati	on

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1.1
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	92.7
1,2-Dichloroethane	0.75	4.8
Benzene	0.75	0.4
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	26.0
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	VR-AC-C-31-B P-71
Operator	RUTH		Lab #:	3064A1.D
Volume		200 ml	Date Ana	04/05/91

Canister	Initial:	700 Final:	700

Compound	MDL Concentration ppbv	
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.5
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-4-3 P-59
Operator	RUTH		Lab #:	3060A1.D
Volume		200 ml	Date Ana	04/05/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	3.0
t-1,2-Dichloroethene	0.75	98.5
Chloroform	0.75	1.7
1,1,1-Trichloroethane	0.75	1.7
1,2-Dichloroethane	0.75	0.3
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	71.6
Toluene	0.75	0.0
Tetrachloroethene	0.75	1.1

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Close Sup cit Laboratory, CH2M Hill

McClellan AfB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-DR-C-4-1 P-60
Operator RUTH Lab #: 3058A2.D
Volume 106 ml Date Ana 04/05/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.42	0.0
Vinyl Chloride	1.42	0.0
Freon-11	1.42	1.5
c-1,2-Dichloroethene	1.42	0.0
1,1-Dichloroethane	1.42	3.5
t-1,2-Dichloroethene	1.42	105.7
Chloroform	1.42	1.7
1,1,1-Trichloroethane	1.42	1.7
1,2-Dichloroethane	1.42	0.3
Benzene	1.42	0.3
Carbon Tetrachloride	1.42	0.0
Trichloroethene	1.42	522.3
Toluene	1.42	0.2
Tetrachloroethene	1.42	1.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-DR-C-4-2 P-56
Operator	RUTH		Lab #:	3059A1.D
Volume		200 ml	Date Ana	04/05/91

Canister	Initial:	700 Final:	7001
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	1.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.4
t-1,2-Dichloroethene	0.75	118.4
Chloroform	0.75	2.1
1,1,1-Trichloroethane	0.75	2.0
1,2-Dichloroethane	0.75	0.3
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	77.2 ⊀
Toluene	0.75	0.1
Tetrachloroethene	0.75	1.1

Environmental Analytical Service 170 Granada, Suite C San Luis Obispo, CA 93401 A THURS LOW

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-DR-C-7-2 P-30
Operator	MILLER	Lab #:	3030B1.D
Volume	21.6 ml	Date Ana	04/05/91

Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	6.94	0.00
Vinyl Chloride	6.94	0.00
Freon-11	6.94	0.00
1,1-Dichloroethene	6.94	0.00
Freon-113	6.94	6827.21
Dichloromethane	6.94	19.80
1,1-Dichloroethane	6.94	553.49
1,2-Dichloroethene	6.94	1539.25
Chloroform	6.94	17.16
1,1,1-Trichlorcethane	6.94	96.08
1,2-Dichloroethane	6.94	213.72
Benzene	6.94	95.40
Carbon Tetrachloride	6.94	0.62
Trichloroethene	6.94	336.47
Toluene	6.94	1.93
Tetrachloroethene	6.94	63.20

Environmental Analytical Service

170 Granada, Suite C

San Luis Obispo, CA 93401

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-7-2 P-27
Operator	MILLER	Lab #:	3039B1.D
Volume	21.6 ml	Date Ana	04/05/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration
		ppbv
Freon-12	6.94	0.00
Vinyl Chloride	6.94	-1.31
Freon-11	6.94	0.00
1,1-Dichloroethene	6.94	0.00
Freon-113	6.94	7997.68
Dichloromethane	6.94	385.11
1,1-Dichloroethane	6.94	16365.78
1,2-Dichloroethene	6.94	6082.77
Chloroform	6.94	75.07
1,1,1-Trichloroethane	6.94	330.03
1,2-Dichloroethane	6.94	712.52
Benzene	6.94	341.75
Carbon Tetrachloride	6.94	0.00
Trichloroethene	6.94	3742.58
Toluene	6.94	0.00
Tetrachloroethene	6.94	85.67

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-3-2 P-35
Operator	MILLER	Lab #:	3025B1.D
Volume	21.6 ml	Date Ana	04/05/91

Canister	Initial:	700 Final:	7001
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Compound	MDL	Concentration
		ppbv
Freon-12	6.94	0.00
Vinyl Chloride	6.94	0.00
Freon-11	6.94	0.00
1,1-Dichloroethene	6.94	4.33
Freon-113	6.94	1037.21
Dichloromethane	6.94	20.51
1,1-Dichloroethane	6.94	0.20
1,2-Dichloroethene	6.94	0.00
Chloroform	6.94	0.20
1,1,1-Trichloroethane	6.94	0.00
1,2-Dichloroethane	6.94	0.19
Benzene	6.94	0.00
Carbon Tetrachloride	6.94	3.88
Trichloroethene	6.94	7.80
Toluene	6.94	0.00
Tetrachloroethene	6.94	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-PC-C-2-2 P-18
Operator	MILLER	Lab #:	3021B1.D
Volume	21.6 ml	Date Ana	04/05/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration	
		ppbv	
Freon-12	6.94	0.00	
Vinyl Chloride	6.94	0.00	
Freon-11	6.94	27.23	
1,1-Dichloroethene	6.94	162.08	ļ
Freon-113	6.94	6561.91	
Dichloromethane	6.94	16.26	
1,1-Dichloroethane	6.94	0.00	
1,2-Dichloroethene	6.94	10.94	
Chloroform	6.94	1.10	
1,1,1-Trichloroethane	6.94	0.00	
1,2-Dichloroethane	6.94	0.29	
Benzene	6.94	1.05	
Carbon Tetrachloride	6.94	69.79	
Trichloroethene	6.94	280.64	
Toluene	6.94	0.63	
Tetrachloroethene	6.94	0.42	

ANALYTICAL RESULTS April 11, 1991

VOLATILE ORGANIC COMPOUND REPORT Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-4-B P-86
Operator	MILLER	Lab #:	3076A1.D
Volume	200 ml	Date Ana	04/11/91

Canister	Initial:	70	O Final:	700
Compound		MDI.	Concentratio	ח

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.2
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-43-1 P-87
Operator	MILLER	Lab #:	3080B1.D
Volume	159 ml	Date Ana	04/11/91

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Canister	Initial:	700 Final:	700
I CONTRO CET	4111-0202.	,00 1 11161	, , ,

Compound	MDL	Concentration ppbv
Freon-12	0.94	0.00
Vinyl Chloride	0.94	0.00
Freon-11	0.94	0.00
1,1-Dichloroethene	0.94	0.29
Freon-113	0.94	7.49
Dichloromethane	0.94	2.20
1,1-Dichloroethane	0.94	0.00
1,2-Dichloroethene	0.94	0.00
Chloroform	0.94	0.00
1,1,1-Trichloroethane	0.94	0.20
1,2-Dichloroethane	0.94	0.20
Benzene	0.94	0.17
Carbon Tetrachloride	0.94	0.00
Trichloroethene	0.94	0.57
Toluene	0.94	0.11
Tetrachloroethene	0.94	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-43-2 P-93
Operator	MILLER	Lab #:	3081B1.D
Volume	200 ml	Date Ana	04/11/91

10	T-14171	200 Eimala	700
Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.20
Freon-113	0.75	8.90
Dichloromethane	0.75	1.55
1,1-Dichloroethane	0.75	0.07
1,2-Dichloroethene	0.75	0.14
Chloroform	0.75	0.03
1,1,1-Trichloroethane	0.75	0.29
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.05
Trichloroethene	0.75	0.47
Toluene	0.75	0.09
Tetrachloroethene	0.75	0.04

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-43-3 P-88
Operator	MILLER	Lab #:	3082A1.D
Volume	200 ml	Date Ana	04/11/91

	2 - 2 - 1 - 1 -	700 711	700
Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.3
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.4
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	1.0
Toluene	0.75	0.2
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-43-4 P-98
Operator MILLER Lab #: 3083A1.D
Volume 159 ml Date Ana 04/11/91

		700 Final:	700
Canister	Initial:		

Compound	MDL	Concentration ppbv
Freon-12	0.94	0.0
Vinyl Chloride	0.94	0.0
Freon-11	0.94	0.0
c-1,2-Dichloroethene	0.94	0.0
1,1-Dichloroethane	0.94	0.0
t-1,2-Dichloroethene	0.94	0.1
Chloroform	0.94	0.0
1,1,1-Trichloroethane	0.94	0.3
1,2-Dichloroethane	0.94	0.0
Benzene	0.94	0.0
Carbon Tetrachloride	0.94	0.0
Trichloroethene	0.94	1.7
Toluene	0.94	0.2
Tetrachloroethene	0.94	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-4-1 P-82
Operator	MILLER	Lab #:	3073A1.D
Volume	116 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.29	0.0
Vinyl Chloride	1.29	0.0
Freon-11	1.29	2.7
c-1,2-Dichloroethene	1.29	0.0
1,1-Dichloroethane	1.29	2.6
t-1,2-Dichloroethene	1.29	122.8
Chloroform	1.29	1.6
1,1,1-Trichloroethane	1.29	1.7
1,2-Dichloroethane	1.29	0.3
Benzene	1.29	0.4
Carbon Tetrachloride	1.29	0.0
Trichloroethene	1.29	106.0
Toluene	1.29	0.3
Tetrachloroethene	1.29	0.9

VOLATILE ORGANIC COMPOUND REPORT Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-44-3 P-85
Operator	MILLER	Lab #:	3088A1.D
Volume	200 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.6
t-1,2-Dichloroethene	0.75	0.4
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.4
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	4.0
Toluene	0.75	0.2
Tetrachloroethene	0.75	0.1

VOLATILE ORGANIC COMPOUND REPORT Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

	CH2M HILL	Location	MW-AC-C-4-2 P-77
Operator	MILLER	Lab #:	3074A1.D
Volume	200 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	1.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.0
t-1,2-Dichloroethene	0.75	101.9
Chloroform	0.75	1.3
1,1,1-Trichloroethane	0.75	1.4
1,2-Dichloroethane	0.75	0.4
Benzene	0.75	0.4
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	0.0
Toluene	0.75	0.4
Tetrachloroethene	0.75	1.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-4 P-75
Operator	MILLER	Lab #:	3079B1.D
Volume	21.6 ml	Date Ana	04/11/91

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Canicror	inirial.	RKI PIMAI'	111641
Canister	Initial:	881 Final:	10041

Compound	MDL	Concentration	
		ppbv	
Freon-12	6.94	0.00	
Vinyl Chloride	6.94	0.00	
Freon-11	6.94	429.61	
1,1-Dichloroethene	6.94	3038.50	
Freon-113	6.94	411.78	
Dichloromethane	6.94	41.38	
1,1-Dichloroethane	6.94	0.00	
1,2-Dichloroethene	6.94	0.00	
Chloroform	6.94	0.41	
1,1,1-Trichloroethane	6.94	4.68	
1,2-Dichloroethane	6.94	1.24	
Benzene	6.94	0.17	
Carbon Tetrachloride	6.94	27.56	
Trichloroethene	6.94	33.31	
Toluene	6.94	0.12	
Tetrachloroethene	6.94	0.00	

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-4	P-75
Operator	MILLER	Lab #:	3079A1.D	
Volume	200 ml	Date Ana	04/11/91	

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Canister	Initial:	881 Final:	1064
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	135.8
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.3
t-1,2-Dichloroethene	0.75	0.3
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.7
1,2-Dichloroethane	0.75	0.3
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	20.7
Trichloroethene	0.75	25.9
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-3 P-96
Operator	MILLER	Lab #:	3078A1.D
Volume	200 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	188.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.2
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.4
1,2-Dichloroethane	0.75	0.3
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	19.6
Trichloroethene	0.75	24.2
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-2 P-74
Operator	RUTH	Lab #:	3077A1.D
Volume	200 ml	Date Ana	04/11/91

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101	Teleli	700 61991	7001
Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	102.9
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.3
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.1
1,2-Dichloroethane	0.75	0.2
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	19.1
Trichloroethene	0.75	22.3
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-4-3 P-91
Operator	RUTH		Lab #:	3075A1.D
Volume		200 ml	Date Ana	04/11/91

1	Initial:	700 Final:	
ICABIETAT	INITIAL	7/11/1 6 1 2 2 1 •	7001
Canister	THILLIAL	YOU PINEL.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

Compound	MDL	. Concentration ppbv	
Freon-12	0.75	0.0	
Vinyl Chloride	0.75	0.0	
Freon-11	0.75	2.4	
c-1,2-Dichloroethene	0.75	0.0	
1,1-Dichloroethane	0.75	3.0	
t-1,2-Dichloroethene	0.75	236.7	
Chloroform	0.75	1.8	
1,1,1-Trichloroethane	0.75	2.5	
1,2-Dichloroethane	0.75	0.0	
Benzene	0.75	0.7	
Carbon Tetrachloride	0.75	0.1	
Trichloroethene	0.75	126.4	
Toluene	0.75	0.3	
Tetrachloroethene	0.75	0.9	

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-5-B P-81
Operator	RUTH		Lab #:	3069A1.D
Volume		200 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	
II'anietet	יותודותוי	700 Final:	7001
1041123662		/ OU TIMET:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.1
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-6-3 P-66
Operator	RUTH	Lab #:	3067A1.D
Volume	104 ml	Date Ana	04/11/91

Canister	Initial:	70	O Final:	700
Compound		MDL	Concentration ppbv	
Freon-12		1.44	0.0	
Vinyl Chloride		1.44	0.0	
Freon-11		1.44	3.0	
c-1,2-Dichloroethe	ne	1.44	0.0	
1,1-Dichlorcethane		1.44	0.3	
t-1,2-Dichloroethe	* 9	1.44	3.8	
Chloroform		1.44	0.3	
1,1,1-Trichloroetha	ane	3.44	0.2	
1,2-Dichloroethane		1.44	0.0	
Benzene		1.44	0.2	
Carbon Tetrachlorio	de	1.44	0.0	

1.44

1.44

1.44

46.2

0.0

0.3

Environmental Analytical Service 170 Granada, Suite C San Luis Obispo, CA 93401

Trichloroethene

Tetrachloroethene

Toluene

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-43-2 P-93
Operator	MILLER	Lab #:	3081B1.D
Volume	200 ml	Date Ana	04/11/91

			700
Canister	Initial:	700 Final:	7001
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.20
Freon-113	0.75	8.90
Dichloromethane	0.75	1.55
1,1-Dichloroethane	0.75	0.07
1,2-Dichloroethene	0.75	0.14
Chloroform	0.75	0.03
1,1,1-Trichloroethane	0.75	0.29
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.05
Trichloroethene	0.75	0.47
Toluene	0.75	0.09
Tetrachloroethene	0.75	0.04

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-43-3 P-88
Operator	MILLER		3082A1.D
Volume	200 ml		04/11/91

Canister	Initial:	700	Final:	700
Compound		MDL	Concentrat	ion
			nnhv	

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.3
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.4
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	1.0
Toluene	0.75	0.2
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-AC-C-4-B P-86
Operator MILLER Lab #: 3076A1.D
Volume 200 ml Date Ana 04/11/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.2
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-43-1 P-87
Operator	MILLER	Lab #:	3080B1.D
Volume	159 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.94	0.00
Vinyl Chloride	0.94	0.00
Freon-11	0.94	0.00
1,1-Dichloroethene	0.94	0.29
Freon-113	0.94	7.49
Dichloromethane	0.94	2.20
1,1-Dichloroethane	0.94	0.00
1,2-Dichloroethene	0.94	0.00
Chloroform	0.94	0.00
1,1,1-Trichloroethane	0.94	0.20
1,2-Dichloroethane	0.94	0.20
Benzene	0.94	0.17
Carbon Tetrachloride	0.94	0.00
Trichloroethene	0.94	0.57
Toluene	0.94	0.11
Tetrachloroethene	0.94	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-4 P-75
Operator	MILLER	Lab #:	3079A1.D
Volume	_200 ml	Date Ana	04/11/91

	_ ' ' ' '	881 Final:	
Canister	Initial:		1064
IL AILLS LEL	1111111111		TOOMI

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	135.8
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.3
t-1,2-Dichloroethene	0.75	0.3
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.7
1,2-Dichloroethane	0.75	0.3
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	20.7
Trichloroethene	0.75	25.9
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-3 P-96
Operator	MILLER	Lab #:	3078A1.D
Volume	200 ml	Date Ana	04/11/91

Commonad		MDI Concentr	:
Canister	Initial:	700 Final:	700]

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	188.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.2
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.4
1,2-Dichloroethane	0.75	0.3
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	19.6
Trichloroethene	0.75	24.2
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-HDR-C-1-2	P-74
Operator	RUTH		Lab #:	3077A1.D	
Volume		200 ml	Date Ana	04/11/91	

Canister	Initial:	70	0 Final:	700
Compound		MDL	Concentration	on

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	102.9
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.2
t-1,2-Dichloroethene	0.75	0.3
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	3.1
1,2-Dichloroethane	0.75	0.2
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	19.1
Trichloroethene	0.75	22.3
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location MW-AC-C-4-3 P-91
Operator	RUTH	Lab #: 🔩 3075A1.D
Volume	200 ml	Date Ana 04/11/91

Canister	Initial:	700 Final:	700
			

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	2.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	3.0
t-1,2-Dichloroethene	0.75	236.7
Chloroform	0.75	1.8
1,1,1-Trichloroethane	0.75	2.5
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.7
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	126.4
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location MW-AC-C-5-B P-8	1
Operator	RUTH	Lab #: 3069A1.D	
Volume	200 ml	Date Ana 04/11/91	

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.0
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.0
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.0
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	0.1
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M	HILL	Location	MW-AC-C-6-3 P-66
Operator	RUTH		Lab #:	3067A1.D
Volume		104 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	1.44	0.0
Vinyl Chloride	1.44	0.0
Freon-11	1.44	3.0
c-1,2-Dichloroethene	1.44	0.0
1,1-Dichloroethane	1.44	0.3
t-1,2-Dichloroethene	1.44	3.8
Chloroform	1.44	0.3
1,1,1-Trichloroethane	1.44	0.2
1,2-Dichloroethane	1.44	0.0
Benzene	1.44	0.2
Carbon Tetrachloride	1.44	0.0
Trichloroethene	1.44	46.2
Toluene	1.44	0.0
Tetrachloroethene	1.44	0.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-43-4 P-98
Operator	MILLER	Lab #:	3083A1.D
Volume	159 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:		700
Compound		MDL	Concentration ppbv	
Freon-12		0.94	0.0	
Vinyl Chloride		0.94	0.0	
Freon-11		0.94	0.0	
c-1,2-Dichloroeth	ene	0.94	0.0	
1,1-Dichloroethan	e	0.94	0.0	
t-1,2-Dichloroeth	ene	0.94	0.1	
Chloroform		0.94	0.0	
1,1,1-Trichloroet	hane	0.94	0.3	
1,2-Dichloroethan	e	0.94	0.0	
Benzene		0.94	0.0	
Carbon Tetrachlor.	ide	0.94	0.0	
Trichloroethene		0.94	1.7	
Toluene		0.94	0.2	
Tetrachloroethene		0.94	0.1	

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-4-1 P-82
Operator	MILLER	Lab #:	3073A1.D
Volume	116 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.29	0.0
Vinyl Chloride	1.29	0.0
Freon-11	1.29	2.7
c-1,2-Dichloroethene	1.29	0.0
1,1-Dichloroethane	1.29	2.6
t-1,2-Dichloroethene	1.29	122.8
Chloroform	1.29	1.6
1,1,1-Trichloroethane	1.29	1.7
1,2-Dichloroethane	1.29	0.3
Benzene	1.29	0.4
Carbon Tetrachloride	1.29	0.0
Trichloroethene	1.29	106.0
Toluene	1.29	0.3
Tetrachloroethene	1.29	0.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-44-3 P-85
Operator	MILLER	Lab #:	3088A1.D
Volume	200 ml	Date Ana	04/11/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.6
t-1,2-Dichloroethene	0.75	0.4
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	0.4
1,2-Dichloroethane	0.75	0.0
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	4.0
Toluene	0.75	0.2
Tetrachloroethene	0.75	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-AC-C-4-2 P-77
Operator	MILLER	Lab #:	3074A1.D
Volume	200 ml	Date Ana	04/11, 91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	1.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.0
t-1,2-Dichloroethene	0.75	101.9
Chloroform	0.75	1.3
1,1,1-Trichloroethane	0.75	1.4
1,2-Dichloroethane	0.75	0.4
Benzene	0.75	0.4
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	0.0
Toluene	0.75	0.4
Tetrachloroethene	0.75	1.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-4 P-75
Operator	MILLER	Lab #:	3079B1.D
Volume	21.6 ml	Date Ana	04/11/91

Canister	Initial:	881 Final:	1064

Compound	MDL	Concentration ppbv
Freon-12	6.94	0.00
Vinyl Chloride	6.94	0.00
Freon-11	6.94	429.61
1,1-Dichloroethene	6.94	3038.50
Freon-113	6.94	411.78
Dichloromethane	6.94	41.38
1,1-Dichloroethane	6.94	0.00
1,2-Dichloroethene	6.94	0.00
Chloroform	6.94	0.41
1,1,1-Trichloroethane	6.94	4.68
1,2-Dichloroethane	6.94	1.24
Benzene	6.94	0.17
Carbon Tetrachloride	6.94	27.56
Trichloroethene	6.94	33.31
Toluene	6.94	0.12
Tetrachloroethene	6.94	0.00

ANALYTICAL RESULTS April 12, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-44-2 P-84
Operator	MILLER	Lab #:	3086B1.D
Volume	200 ml	Date Ana	04/12/91

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Canister	Initial:	700 Final:	/ 001
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	3.73	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	1.02
Freon-113	0.75	6.95
Dichloromethane	0.75	0.50
1,1-Dichloroethane	0.75	0.51
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.08
1,1,1-Trichloroethane	0.75	0.28
1,2-Dichloroethane	0.75	0.07
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.08
Trichloroethene	0.75	0.70
Toluene	0.75	0.02
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-HDR-C-9-1 P-94
Operator	MILLER	Lab #:	3106A1.D
Volume	200 ml	Date Ana	04/12/91

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Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	47.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1.8
t-1,2-Dichloroethene	0.75	0.7
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	18.5
1,2-Dichloroethane	0.75	1.2
Benzene	0.75	0.5
Carbon Tetrachloride	0.75	0.6
Trichloroethene	0.75	48.1
Toluene	0.75	0.2
Tetrachloroethene	0.75	1.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-HDR-C-7-4 P-10
Operator	MILLER	Lab #:	3115A1.D
Volume	100 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.50	0.0
Vinyl Chloride	1.50	0.0
Freon-11	1.50	502.0
c-1,2-Dichloroethene	1.50	0.0
1,1-Dichloroethane	1.50	4490.3
t-1,2-Dichloroethene	1.50	4128.7
Chloroform	1.50	36.8
1,1,1-Trichloroethane	1.50	224.4
1,2-Dichloroethane	1.50	480.4
Benzene	1.50	203.6
Carbon Tetrachloride	1.50	1.5
Trichloroethene	1.50	1389.3
Toluene	1.50	5.0
Tetrachloroethene	1.50	150.8

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-61-B
Operator	LONGACRE	Lab #:	3098B1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration
}		ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.68
Freon-113	0.75	0.48
Dichloromethane	0.75	1.44
1,1-Dichloroethane	0.75	0.04
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	0.06
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.44
Toluene	0.75	0.06
Tetrachloroethene	0.75	0.00

Environmental Analytical Service 170 Granada, Suite C

San Luis Obispo, CA 93401

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-39-B
Operator	LONGACRE	Lab #:	120B1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.08
Vinyl Chloride	0.75	0.09
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	2.46
Freon-113	0.75	1.59
Dichloromethane	0.75	2.17
1,1-Dichloroethane	0.75	0.12
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	0.85
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.10
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.66
Toluene	0.75	0.10
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-35-3 P-10
Operator	MILLER	Lab #:	3113A1.D
Volume	200 ml	Date Ana	04/12/91

1 - 1 -	Initial:	700 Final:	7001
Canister	[P1P131.	7(1(1) 5(3) 7(3) ()	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.9
t-1,2-Dichloroethene	0.75	0.2
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	106.2
1,2-Dichloroethane	0.75	5.7
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	44.9
Toluene	0.75	0.0
Tetrachloroethene	0.75	1.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-35-2 P-10
Operator MILLER Lab #: 3112A1.D
Volume 159 ml Date Ana 04/12/91

		700 Final:	700
Canadeae	19171311	//// #// 1921 *	7///
Canister	Initial:	/ 00 I IIId I .	, , ,

Compound	MDL	Concentration ppbv
Freon-12	0.94	0.0
Vinyl Chloride	0.94	0.0
Freon-11	0.94	0.1
c-1,2-Dichloroethene	0.94	0.0
1,1-Dichloroethane	0.94	1.3
t-1,2-Dichloroethene	C.94	0.4
Chloroform	0.94	0.3
1,1,1-Trichloroethane	0.94	141.4
1,2-Dichloroethane	0.94	7.6
Benzene	0.94	0.3
Carbon Tetrachloride	0.94	0.1
Trichloroethene	0.94	62.7
Toluene	0.94	0.0
Tetrachloroethene	0.94	1.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-PC-C-35-4 P-11
Operator	MILLER	Lab #:	3109B1.D
Volume	200 ml	Date Ana	04/12/91

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ICABIETAY	[DIPIG!	700 61931.	7001
Canister	Initial:	700 Final:	7001

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.00
Freon-113	0.75	106.17
Dichloromethane	0.75	2.59
1,1-Dichloroethane	0.75	2.38
1,2-Dichloroethene	0.75	0.39
Chloroform	0.75	0.55
1,1,1-Trichloroethane	0.75	145.59
1,2-Dichloroethane	0.75	8.13
Benzene	0.75	0.29
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	68.00
Toluene	0.75	0.08
Tetrachloroethene	0.75	2.25

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-PC-C-35-5 P-11
Operator	MILLER	Lab #:	3111A1.D
Volume	200 ml	Date Ana	04/12/91

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Canister	iniriali	700 Final:	7001
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.5
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.3
1,1,1-Trichloroethane	0.75	133.4
1,2-Dichloroethane	0.75	7.4
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	67.8
Toluene	0.75	0.0
Tetrachloroethene	0.75	2.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-35-1 P-10
Operator	MILLER	Lab #:	3110A1.D
Volume	190 ml	Date Ana	04/12/91

Canister Initial: 700 Final:		 		
Canister		200 5:1.		
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Compound	MDL	Concentration ppbv
Freon-12	0.79	0.0
Vinyl Chloride	0.79	0.0
Freon-11	0.79	0.0
c-1,2-Dichloroethene	0.79	0.0
1,1-Dichloroethane	0.79	0.5
t-1,2-Dichloroethene	0.79	0.2
Chloroform	0.79	0.1
1,1,1-Trichloroethane	0.79	125.7
1,2-Dichloroethane	0.79	6.9
Benzene	0.79	0.2
Carbon Tetrachloride	0.79	0.1
Trichloroethene	0.79	61.4
Toluene	0.79	0.1
Tetrachloroethene	0.79	1.8

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-39-3 P-11
Operator	MILLER	Lab #:	3119B1.D
Volume	200 ml	Date Ana	04/12/91

10	T-14-1-1-	700 Final:	700
Canister	Initial:	/U() FIDAL*	700
	**** F # G # *	,00 111141.	, 001

Compound	MDL	Concentration
		ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	15.82
Freon-113	0.75	25.79
Dichloromethane	0.75	1.20
1,1-Dichloroethane	0.75	0.43
1,2-Dichloroethene	0.75	0.10
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	21.00
1,2-Dichloroethane	0.75	1.30
Benzene	0.75	0.07
Carbon Tetrachloride	0.75	0.07
Trichloroethene	0.75	7.85
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.19

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-34-3 P-12
Operator	MILLER	Lab #:	3104B1.D
Volume	137 ml	Date Ana	04/12/91

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Canister	1111 6161.	, , , , , , , , , , , , , , , , , , , ,	, , ,

Compound	MDL	Concentration
		ppbv
Freon-12	1.09	0.00
Vinyl Chloride	1.09	0.16
Freon-11	1.09	0.00
1,1-Dichloroethene	1.09	160.06
Freon-113	1.09	123.43
Dichloromethane	1.09	4.29
1,1-Dichloroethane	1.09	1.74
1,2-Dichloroethene	1.09	0.63
Chloroform	1.09	0.35
1,1,1-Trichloroethane	1.09	207.23
1,2-Dichloroethane	1.09	12.20
Benzene	1.09	0.43
Carbon Tetrachloride	1.09	0.12
Trichloroethene	1.09	71.49
Toluene	1.09	0.00
Tetrachloroethene	1.09	1.16

Close Support Laboratomy, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-34-B P-12
operator	MILLER	Lab #:	3101A1.D
Volume	200 ml	Date Ana	04/12/91

Canister		700 Final:	7001
ICARIETAY	1017131	700 61891	7001
ICAHISTEL	Initial:	/UU FINAL	/ 001

Compound	MDL	Concentration
		ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.07
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	4.08
Freon-113	0.75	3.14
Dichloromethane	0.75	1.61
1,1-Dichloroethane	0.75	1.14
1,2-Dichloroethene	0.75	1.79
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	5.87
1,2-Dichloroethane	0.75	0.41
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	1.13
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.07

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-34-1 P-12
Operator	MILLER	Lab #:	3102A1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.9
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	3.1
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.6
1,1,1-Trichloroethane	0.75	308.1
1,2-Dichloroethane	0.75	17.9
Benzene	0.75	0.5
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	110.0
Toluene	0.75	0.3
Tetrachloroethene	0.75	2.6

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-34-2 P-11
Operator	MILLER	Lab #:	3103A1.D
Volume	180 ml	Date Ana	04/12/91

Canister	Initial:	70	O Final:	700
Compound		MDL	Concentrat	ion

Compound	MDL	Concentration ppbv
Freon-12	0.83	0.0
Vinyl Chloride	0.83	0.0
Freon-11	0.83	0.2
c-1,2-Dichloroethene	0.83	0.0
1,1-Dichloroethane	0.83	1.6
t-1,2-Dichloroethene	0.83	0.4
Chloroform	0.83	0.3
1,1,1-Trichloroethane	0.83	217.9
1,2-Dichloroethane	0.83	13.6
Benzene	0.83	0.4
Carbon Tetrachloride	0.83	0.1
Trichloroethene	0.83	87.2
Toluene	0.83	0.0
Tetrachloroethene	0.83	2.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-43-B P-8	3
Operator	MILLER	Lab #:	3087B1.D	
Volume	200 ml	Date Ana	04/12/91	

Canister Initial: 700 Final:	
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.17
Freon-11	0.75	0.03
1,1-Dichloroethene	0.75	1.00
Freon-113	0.75	3.59
Dichloromethane	0.75	1.83
1,1-Dichloroethane	0.75	0.00
1,2-Dichloroethene	0.75	0.06
Chloroform	0.75	0.03
1,1,1-Trichloroethane	0.75	0.00
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.06
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.37
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-44-B P-78
Operator	MILLER	Lab #:	3084B1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration
		ppbv
Freon-12	0.75	0.06
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.10
1,1-Dichloroethene	0.75	2.12
Freon-113	0.75	90.76
Dichloromethane	0.75	1.63
1,1-Dichloroethane	0.75	0.00
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	0.00
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.04
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.49
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-5 P-92
Operator	MILLER	Lab #:	3089A1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	70	700 Final:	
Compound		MDL	Concentration ppbv	
Freon-12		0.75	0.0	
Vinyl Chloride		0.75	0.0	
Freon-11		0.75	237.3	
c-1,2-Dichloroether	ne	0.75	0.0	
1,1-Dichloroethane		0.75	0.3	
t-1,2-Dichloroether	ne	0.75	0.8	
Chloroform		0.75	0.2	
1,1,1-Trichloroeth	ane	0.75	6.3	
1,2-Dichloroethane		0.75	0.5	
Benzene		0.75	0.3	
Carbon Tetrachlorio	de	0.75	29.8	
Trichloroethene		0.75	19.7	
Toluene		0.75	0.3	

0.75

0.0

Environmental Analytical Service 170 Granada, Suite C San Luis Obispo, CA 93401

Tetrachloroethene

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

	CH2M HILL	Location	VR-AC-C-44-1 P-80
Operator	MILLER	Lab #:	3085A1.D
Volume		Date Ana	04/12/91

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Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.79	0.0
Vinyl Chloride	0.79	0.0
Freon-11	0.79	0.1
c-1,2-Dichloroethene	0.79	0.0
1,1-Dichloroethane	0.79	0.5
t-1,2-Dichloroethene	0.79	0.2
Chloroform	0.79	0.1
1,1,1-Trichloroethane	0.79	0.2
1,2-Dichloroethane	0.79	0.2
Benzene	0.79	0.1
Carbon Tetrachloride	0.79	0.0
Trichloroethene	0.79	3.0
Toluene	0.79	0.0
Tetrachloroethene	0.79	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-6	P-97
Operator	MILLER	Lab #:	3090B1.D	j
Volume	21.6 ml	Date Ana	04/12/91	

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	6.94	0.0
Vinyl Chloride	6.94	0.0
Freon-11	6.94	468.6
1,1-Dichloroethene	6.94	7554.2
Freon-113	6.94	806.1
t-1,2-Dichloroethene	6.94	37.2
1,2-Dichloroethene	6.94	0.0
Bromochloromethane	6.94	9.3
Chloroform	6.94	0.0
1,1,1-Trichloroethane	6.94	5.3
1,2-Dichloroethane	6.94	0.0
Carbon Tetrachloride	6.94	28.9
1,4-Difluorobenzene	6.94	9.3
Trichloroethene	6.94	47.5

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-HDR-C-1-6 P-97
Operator MILLER Lab #: 3090A1.D
Volume 200 ml Date Ana 04/12/91

<u> </u>		200 2 1	300
Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.5
t-1,2-Dichloroethene	0.75	1.9
Chloroform	0.75	0.3
1,1,1-Trichloroethane	0.75	3.6
1,2-Dichloroethane	0.75	0.6
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	20.3
Trichloroethene	0.75	53.7
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.5

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-7-1 P-89
Operator	MILLER	Lab #:	3091A1.D
Volume	128 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.17	0.0
Vinyl Chloride	1.17	0.0
Freon-11	1.17	7717.9
c-1,2-Dichloroethene	1.17	0.0
1,1-Dichloroethane	1.17	125805.8
t-1,2-Dichloroethene	1.17	4029.5
Chloroform	1.17	769.7
1,1,1-Trichloroethane	1.17	265.3
1,2-Dichloroethane	1.17	581.1
Benzene	1.17	249.4
Carbon Tetrachloride	1.17	2.3
Trichloroethene	1.17	2981.0
Toluene	1.17	5.9
Tetrachloroethene	1.17	131.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-35-B P-10
Operator MILLER Lab #: 3108B1.D
Volume 200 ml Date Ana 04/12/91

Canister Initial: 700 Final: 700

Compound	MDL	Concentration
<u> </u>		ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.03
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.41
Freon-113	0.75	0.40
Dichloromethane	0.75	1.78
1,1-Dichloroethane	0.75	0.05
1,2-Dichloroethene	0.75	0.08
Chloroform	0.75	0.02
1,1,1-Trichloroethane	0.75	0.11
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.02
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.16
Toluene	0.75	0.08
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-35-B P-10
Operator	MILLER	Lab #:	3108B1.D
Volume	200 ml	Date Ana	04/12/91

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Canister	Initial:	700 61991	7001
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.03
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.41
Freon-113	0.75	0.40
Dichloromethane	0.75	1.78
1,1-Dichloroethane	0.75	0.05
1,2-Dichloroethene	0.75	0.08
Chloroform	0.75	0.02
1,1,1-Trichloroethane	0.75	0.11
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.02
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.16
Toluene	0.75	0.08
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-35-3 P-10
Operator MILLER Lab #: 3113A1.D
Volume 200 ml Date Ana 04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.9
t-1,2-Dichloroethene	0.75	0.2
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	106.2
1,2-Dichloroethane	0.75	5.7
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	44.9
Toluene	0.75	0.0
Tetrachloroethene	0.75	1.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-35-2 P-10
Operator	MILLER	Lab #:	3112A1.D
Volume	159 ml	Date Ana	04/12/91

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Compound	MDL	Concentration ppbv
Freon-12	0.94	0.0
Vinyl Chloride	0.94	0.0
Freon-11	0.94	0.1
c-1,2-Dichloroethene	0.94	0.0
1,1-Dichloroethane	0.94	1.3
t-1,2-Dichloroethene	0.94	0.4
Chloroform	0.94	0.3
1,1,1-Trichloroethane	0.94	141.4
1,2-Dichloroethane	0.94	7.6
Benzene	0.94	0.3
Carbon Tetrachloride	0.94	0.1
Trichloroethene	0.94	62.7
Toluene	0.94	0.0
Tetrachloroethene	0.94	1.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-PC-C-35-4 P-11
Operator	MILLER	Lab #:	3109B1.D
Volume	200 ml	Date Ana	04/12/91

16	T	700 Final:	700
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Canister	Initial:	/ UU I IIIGI .	, , ,

Compound	MDL	Concentration
E	^ 7E	ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.00
Freon-113	0.75	106.17
Dichloromethane	0.75	2.59
1,1-Dichloroethane	0.75	2.38
1,2-Dichloroethene	0.75	0.39
Chloroform	0.75	0.55
1,1,1-Trichloroethane	0.75	145.59
1,2-Dichloroethane	0.75	8.13
Benzene	0.75	0.29
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	68.00
Toluene	0.75	0.08
Tetrachloroethene	0.75	2.25

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-PC-C-35-5 P-11
Operator	MILLER	Lab #:	3111A1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.Q
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.5
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.3
1,1,1-Trichloroethane	0.75	133.4
1,2-Dichloroethane	0.75	7.4
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	67.8
Toluene	0.75	0.0
Tetrachloroethene	0.75	2.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-35-1 P-10
Operator MILLER Lab #: 3110A1.D
Volume 190 ml Date Ana 04/12/91

Canterar	Teifial	700 Final:	700
Canister	Initial:	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	7001

Compound	MDL	Concentration ppbv
Freon-12	0.79	0.0
Vinyl Chloride	0.79	0.0
Freon-11	0.79	0.0
c-1,2-Dichloroethene	0.79	0.0
1,1-Dichloroethane	0.79	0.5
t-1,2-Dichloroethene	0.79	0.2
Chloroform	0.79	0.1
1,1,1-Trichloroethane	0.79	125.7
1,2-Dichloroethane	0.79	6.9
Benzene	0.79	0.2
Carbon Tetrachloride	0.79	0.1
Trichloroethene	0.79	61.4
Toluene	0.79	0.1
Tetrachloroethene	0.79	1.8

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-39-3 P-11
Operator	MILLER	Lab #:	3119B1.D
Volume	200 ml	Date Ana	04/12/91

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Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	15.82
Freon-113	0.75	25.79
Dichloromethane	0.75	1.20
1,1-Dichloroethane	0.75	0.43
1,2-Dichloroethene	0.75	0.10
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	21.00
1,2-Dichloroethane	0.75	1.30
Benzene	0.75	0.07
Carbon Tetrachloride	0.75	0.07
Trichloroethene	0.75	7.85
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.19

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-34-3 P-12
Operator	MILLER	Lab #:	3104B1.D
Volume	137 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.09	0.00
Vinyl Chloride	1.09	0.16
Freon-11	1.09	0.00
1,1-Dichloroethene	1.09	160.06
Freon-113	1.09	123.43
Dichloromethane	1.09	4.29
1,1-Dichloroethane	1.09	1.74
1,2-Dichloroethene	1.09	0.63
Chloroform	1.09	0.35
1,1,1-Trichloroethane	1.09	207.23
1,2-Dichloroethane	1.09	12.20
Benzene	1.09	0.43
Carbon Tetrachloride	1.09	0.12
Trichloroethene	1.09	71.49
Toluene	1.09	0.00
Tetrachloroethene	1.09	1.16

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-34-B P-12
Operator	MILLER	Lab #:	3101A1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.07
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	4.08
Freon-113	0.75	3.14
Dichloromethane	0.75	1.61
1,1-Dichloroethane	0.75	1.14
1,2-Dichloroethene	0.75	1.79
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	5.87
1,2-Dichloroethane	0.75	0.41
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	1.13
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.07

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-34-1 P-12
Operator MILLER Lab #: 3102A1.D
Volume 200 ml Date Ana 04/12/91

Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.9
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	3.1
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.6
1,1,1-Trichloroethane	0.75	308.1
1,2-Dichloroethane	0.75	17.9
Benzene	0.75	0.5
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	110.0
Toluene	0.75	0.3
Tetrachloroethene	0.75	2.6

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-34-2 P-11
Operator	MILLER	Lab #:	3103A1.D
Volume	180 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.83	0.0
Vinyl Chloride	0.83	0.0
Freon-11	0.83	0.2
c-1,2-Dichloroethene	0.83	0.0
1,1-Dichloroethane	0.83	1.6
t-1,2-Dichloroethene	0.83	0.4
Chloroform	0.83	0.3
1,1,1-Trichloroethane	0.83	217.9
1,2-Dichloroethane	0.83	13.6
Benzene	0.83	0.4
Carbon Tetrachloride	0.83	0.1
Trichloroethene	0.83	87.2
Toluene	0.83	0.0
Tetrachloroethene	0.83	2.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-43-B P-83
Operator	MILLER	Lab #:	3087B1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.17
Freon-11	0.75	0.03
1,1-Dichloroethene	0.75	1.00
Freon-113	0.75	3.59
Dichloromethane	0.75	1.83
1,1-Dichloroethane	0.75	0.00
1,2-Dichloroethene	0.75	0.06
Chloroform	0.75	0.03
1,1,1-Trichloroethane	0.75	0.00
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.06
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.37
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-44-2 P-84
Operator	MILLER	Lab #:	3086B1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	1.02
Freon-113	0.75	6.95
Dichloromethane	0.75	0.50
1,1-Dichloroethane	0.75	0.51
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.08
1,1,1-Trichloroethane	0.75	0.28
1,2-Dichloroethane	0.75	0.07
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.08
Trichloroethene	0.75	0.70
Toluene	0.75	0.02
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-HDR-C-9-1 P-94
Operator	MILLER	Lab #:	3106A1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	47.7
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1.8
t-1,2-Dichloroethene	0.75	0.7
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	18.5
1,2-Dichloroethane	0.75	1.2
Benzene	0.75	0.5
Carbon Tetrachloride	0.75	0.6
Trichloroethene	0.75	48.1
Toluene	0.75	0.2
Tetrachloroethene	0.75	1.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-HDR-C-7-4 P-10
Operator	MILLER	Lab #:	3115A1.D
Volume	100 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:		700
Compound		MDL	Concentration ppbv	
Freon-12		1.50	0.0	
Vinyl Chloride		1.50	0.0	
Freon-11		1.50	502.0	
c-1,2-Dichloroethe	ene	1.50	0.0	
1,1-Dichloroethane		1.50	4490.3	
t-1,2-Dichloroethe	ene	1.50	4128.7	
Chloroform		1.50	36.8	
1,1,1-Trichloroeth	nane	1.50	224.4	
1,2-Dichloroethane	2	1.50	480.4	
Benzene		1.50	203.6	
Carbon Tetrachlori	ide	1.50	1.5	
Trichloroethene		1.50	1389.3	
Toluene		1.50	5.0	

1.50

150.8

Environmental Analytical Service 170 Granada, Suite C San Luis Obispo, CA 93401

Tetrachloroethene

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-61-B
Operator	LONGACRE	Lab #:	3098B1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration
		ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	0.68
Freon-113	0.75	0.48
Dichloromethane	0.75	1.44
1,1-Dichloroethane	0.75	0.04
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	0.06
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.00
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.44
Toluene	0.75	0.06
Tetrachloroethene	0.75	0.00

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170 Granada, Suite C

San luis Obispo, CA 93401

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-39-B
Operator	LONGACRE	Lab #:	120B1.D
Volume	200 ml	Date Ana	04/12/91

1 📥	Initial:	700 Final:	
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Canister	1111-1141.	/OU LINGI.	700

Compound	MDL	Concentration
<u> </u>		ppbv
Freon-12	0.75	0.08
Vinyl Chloride	0.75	0.09
Freon-11	0.75	0.00
1,1-Dichloroethene	0.75	2.46
Freon-113	0.75	1.59
Dichloromethane	0.75	2.17
1,1-Dichloroethane	0.75	0.12
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	0.85
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.10
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.66
Toluene	0.75	0.10
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-44-B P-78
Operator	MILLER	Lab #:	3084B1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
T	0.75	
Freon-12	0.75	0.06
Vinyl Chloride	0.75	0.00
Freon-11	0.75	0.10
1,1-Dichloroethene	0.75	2.12
Freon-113	0.75	90.76
Dichloromethane	0.75	1.63
1,1-Dichloroethane	0.75	0.00
1,2-Dichloroethene	0.75	0.00
Chloroform	0.75	0.00
1,1,1-Trichloroethane	0.75	0.00
1,2-Dichloroethane	0.75	0.00
Benzene	0.75	0.04
Carbon Tetrachloride	0.75	0.00
Trichloroethene	0.75	0.49
Toluene	0.75	0.00
Tetrachloroethene	0.75	0.00

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-5 P-92
Operator	MILLER	Lab #:	3089A1.D
Volume	200 ml	Date Ana	04/12/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	237.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.3
t-1,2-Dichloroethene	0.75	0.8
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	6.3
1,2-Dichloroethane	0.75	0.5
Benzene	0.75	0.3
Carbon Tetrachloride	0.75	29.8
Trichloroethene	0.75	19.7
Toluene	0.75	0.3
Tetrachloroethene	0.75	0.0

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-44-1 P-80
Operator	MILLER	Lab #:	3085A1.D
Volume	190 ml	Date Ana	04/12/91

Canister Initial: 700 Final: 700				
Canister Initial: /OU Final: /OU				
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	(CANISEEL	****	/ UU TIMAI.	/ 001

Compound	MDL	Concentration ppbv
Freon-12	0.79	0.0
Vinyl Chloride	0.79	0.0
Freon-11	0.79	0.1
c-1,2-Dichloroethene	0.79	0.0
1,1-Dichloroethane	0.79	0.5
t-1,2-Dichloroethene	0.79	0.2
Chloroform	0.79	0.1
1,1,1-Trichloroethane	0.79	0.2
1,2-Dichloroethane	0.79	0.2
Benzene	0.79	0.1
Carbon Tetrachloride	0.79	0.0
Trichloroethene	0.79	3.0
Toluene	0.79	0.0
Tetrachloroethene	0.79	0.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-1-6 P-97
Operator	MILLER	Lab #:	3090B1.D
Volume	21.6 ml	Date Ana	04/12/91

	- ' - '	### ### 1 ·	
Canister	Initial:	700 Final:	7001
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Compound	MDL	Concentration ppbv
Freon-12	6.94	0.0
Vinyl Chloride	6.94	0.0
Freon-11	6.94	468.6
1,1-Dichloroethene	6.94	7554.2
Freon-113	6.94	806.1
t-1,2-Dichloroethene	6.94	37.2
1,2-Dichloroethene	6.94	0.0
Bromochloromethane	6.94	9.3
Chloroform	6.94	0.0
1,1,1-Trichloroethane	6.94	5.3
1,2-Dichloroethane	6.94	0.0
Carbon Tetrachloride	6.94	28.9
1,4-Difluorobenzene	6.94	9.3
Trichloroethene	6.94	47.5

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-HDR-C-1-6 P-97
Operator MILLER Lab #: 3090A1.D
Volume 200 ml Date Ana 04/12/91

Canister Initial: 700 Final: 70				
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.0
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.5
t-1,2-Dichloroethene	0.75	1.9
Chloroform	0.75	0.3
1,1,1-Trichloroethane	0.75	3.6
1,2-Dichloroethane	0.75	0.6
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	20.3
Trichloroethene	0.75	53.7
Toluene	0.75	0.1
Tetrachloroethene	0.75	0.5

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-C-7-1 P-89
Operator	MILLER	Lab #:	3091 A 1.D
Volume	_ 128 ml	Date Ana	04/12/91

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Canister	Initial:	700 Final:	7001

Compound	MDL	Concentration ppbv
Freon-12	1.17	0.0
Vinyl Chloride	1.17	0.0
Freon-11	1.17	7717.9
c-1,2-Dichloroethene	1.17	0.0
1,1-Dichloroethane	1.17	125805.8
t-1,2-Dichloroethene	1.17	4029.5
Chloroform	1.17	769.7
1,1,1-Trichloroethane	1.17	265.3
1,2-Dichloroethane	1.17	581.1
Benzene	1.17	249.4
Carbon Tetrachloride	1.17	2.3
Trichloroethene	1.17	2981.0
Toluene	1.17	5.9
Tetrachloroethene	1.17	131.3

ANALYTICAL RESULTS
April 13, 1991

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-PC-C-36-5 P125
Operator	MILLER	Lab #:	3126A1.D
Volume	200 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.4
Freon-11	0.75	0.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.7
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	146.7
1,2-Dichloroethane	0.75	9.8
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	56.9
Toluene	0.75	0.0
Tetrachloroethene	0.75	2.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VRAC-C-36-1 P11
Operator	MILLER	Lab #:	3122A1.D
Volume	21.6 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	6.94	0.0
Vinyl Chloride	6.94	0.0
Freon-11	6.94	2.9
c-1,2-Dichloroethene	6.94	0.0
1,1-Dichloroethane	6.94	17.2
t-1,2-Dichloroethene	6.94	8.6
Chloroform	6.94	1.5
1,1,1-Trichloroethane	6.94	252.8
1,2-Dichloroethane	6.94	20.3
Benzene	6.94	1.1
Carbon Tetrachloride	6.94	0.0
Trichloroethene	6.94	199.6
Toluene	6.94	0.0
Tetrachloroethene	6.94	3.6

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-39-1 P128
Operator	MILLER	Lab #:	3117A1.D
Volume	200 ml	Date Ana	04/13/91

		700 Final:	
Canister	Initial:	700 61981	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.4
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	37.3
1,2-Dichloroethane	0.75	2.4
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	11.5
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-39-2 P126
Operator	MILLER	Lab #:	3118A1.D
Volume	200 ml	Date Ana	04/13/91

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Canister	THIPIDIO	700 61831.	7001
I CGIITO CET	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	0.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.7
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	30.0
1,2-Dichloroethane	0.75	1.8
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	10.3
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.4

VOLATILE ORGANIC COMPOUND REPORT Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-61-1
Operator	MILLER	Lab #:	3099A1.D
Volume	200 ml	Date Ana	04/13/91

a		700 Final:	700
Canister	Initial:	/UG FIDAL	/13011
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.5
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	243.4
t-1,2-Dichloroethene	0.75	444.3
Chloroform	0.75	1.1
1,1,1-Trichloroethane	0.75	103.1
1,2-Dichloroethane	0.75	7.0
Benzene	0.75	0.7
Carbon Tetrachloride	0.75	0.2
Trichloroethene	0.75	184.2
Toluene	0.75	0.0
Tetrachloroethene	0.75	34.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-61-2 P116
Operator	MILLER	Lab #:	3092A1.D
Volume	200 ml	Date Ana	04/13/91

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Canister Initial: 700 Final:	7001
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	1.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	218.6
t-1,2-Dichloroethene	0.75	422.9
Chloroform	0.75	1.2
1,1,1-Trichloroethane	0.75	39.7
1,2-Dichloroethane	0.75	13.5
Benzene	0.75	1.0
Carbon Tetrachloride	0.75	0.3
Trichloroethene	0.75	215.4
Toluene	0.75	0.1
Tetrachloroethene	0.75	22.7

VOLATILE ORGANIC COMPOUND REPORT Close Support Laboratory, CH2M Hill

McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-36-3
Operator	MILLER	Lab #:	3124A1.D
Volume	220 ml	Date Ana	04/13/91

Canister	Initial:	640 Final:	1095

Compound	MDL	Concentration ppbv
Freon-12	0.68	0.0
Vinyl Chloride	0.68	0.0
Freon-11	0.68	0.0
c-1,2-Dichloroethene	0.68	0.0
1,1-Dichloroethane	0.68	2.5
t-1,2-Dichloroethene	0.68	0.6
Chloroform	0.68	0.5
1,1,1-Trichloroethane	0.68	156.0
1,2-Dichloroethane	0.68	10.5
Benzene	0.68	0.3
Carbon Tetrachloride	0.68	0.0
Trichloroethene	0.68	62.1
Toluene	0.68	0.1
Tetrachloroethene	0.68	1.7

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-HDR-C-9-2 P117
Operator MILLER Lab #: 3107B1.D
Volume 200 ml Date Ana 04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	54.85
1,1-Dichloroethene	0.75	0.00
Freon-113	0.75	306.00
Dichloromethane	0.75	6.42
1,1-Dichloroethane	0.75	1.40
1,2-Dichloroethene	0.75	0.55
Chloroform	0.75	0.53
1,1,1-Trichloroethane	0.75	16.11
1,2-Dichloroethane	0.75	1.22
Benzene	0.75	0.24
Carbon Tetrachloride	0.75	0.57
Trichloroethene	0.75	40.41
Toluene	0.75	0.10
Tetrachloroethene	0.75	1.80

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location MW-HDR--C-7-3 P10
Operator MILLER Lab #: 3114A1.D
Volume 200 ml Date Ana 04/13/91

Canister Initial: 700 Final: 700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	140.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1905.3
t-1,2-Dichloroethene	0.75	1005.9
Chloroform	0.75	16.2
1,1,1-Trichloroethane	0.75	64.2
1,2-Dichloroethane	0.75	168.5
Benzene	0.75	59.4
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	121.1
Toluene	0.75	2.0
<u> </u>	0.75	48.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-36-2
Operator	MILLER	Lab #:	3123A1.D
Volume	149 ml	Date Ana	04/13/91

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Canister In	11 T 1 S 1	יובתוא י	mn
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Compound	MDL	Concentration ppbv
Freon-12	1.01	0.0
Vinyl Chloride	1.01	0.7
Freon-11	1.01	0.9
c-1,2-Dichloroethene	1.01	0.0
1,1-Dichloroethane	1.01	3.6
t-1,2-Dichloroethene	1.01	1.7
Chloroform	1.01	0.6
1,1,1-Trichloroethane	1.01	118.0
1,2-Dichloroethane	1.01	8.2
Benzene	1.01	0.5
Carbon Tetrachloride	1.01	0.0
Trichloroethene	1.01	49.3
Toluene	1.01	0.0
Tetrachloroethene	1.01	0.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDRC-9-3 P12
Operator	MILLER	Lab #:	3116A1.D
Volume	190 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.79	0.0
Vinyl Chloride	0.79	0.0
Freon-11	0.79	35.1
c-1,2-Dichloroethene	0.79	0.0
1,1-Dichloroethane	0.79	317.4
t-1,2-Dichloroethene	0.79	400.6
Chloroform	0.79	5.8
1,1,1-Trichloroethane	0.79	42.3
1,2-Dichloroethane	0.79	72.4
Benzene	0.79	24.8
Carbon Tetrachloride	0.79	0.8
Trichloroethene	0.79	110.2
Toluene	0.79	0.7
Tetrachloroethene	0.79	21.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDRC-9-4 P11
Operator	MILLER	Lab #:	3127A1.D
Volume	200 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700
			الكانواسىيون الكانوا

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	14.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	3.9
t-1,2-Dichloroethene	0.75	3.9
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	16.1
1,2-Dichloroethane	0.75	2.2
Benzene	0.75	0.7
Carbon Tetrachloride	0.75	0.6
Trichloroethene	0.75	153.8
Toluene	0.75	0.1
Tetrachloroethene	0.75	2.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-7-2
Operator	MILLER	Lab #:	3105A1.D
Volume	159 ml	Date Ana	04/13/91

anister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.94	0.0
Vinyl Chloride	0.94	0.0
Freon-11	0.94	104.7
c-1,2-Dichloroethene	0.94	0.0
1,1-Dichloroethane	0.94	3493.6
t-1,2-Dichloroethene	0.94	3415.7
Chloroform	0.94	29.2
1,1,1-Trichloroethane	0.94	180.6
1,2-Dichloroethane	0.94	441.6
Benzene	0.94	152.9
Carbon Tetrachloride	0.94	0.0
Trichloroethene	0.94	1523.2
Toluene	0.94	2.8
Tetrachloroethene	0.94	80.5

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-PC-C-36-5 P125
Operator	MILLER	Lab #:	3126A1.D
Volume	200 ml	Date Ana	04/13/91

	Initial:	700 Final:	
Canister	inirial	700 6172	7001
Cantocer	T117 CTGT.	,00 1 11101	, , ,

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.4
Freon-11	0.75	0.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	2.7
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.0
1,1,1-Trichloroethane	0.75	146.7
1,2-Dichloroethane	0.75	9.8
Benzene	0.75	0.2
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	56.9
Toluene	0.75	0.0
Tetrachloroethene	0.75	2.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VRAC-C-36-1 P11
Operator	MILLER	Lab #:	3122A1.D
Volume	21.6 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700
Cantacer	1117 61 61 61	700111141	7 0 0

Compound	MDL	Concentration ppbv
Freon-12	6.94	0.0
Vinyl Chloride	6.94	0.0
Freon-11	6.94	2.9
c-1,2-Dichloroethene	6.94	0.0
1,1-Dichloroethane	6.94	17.2
t-1,2-Dichloroethene	6.94	8.6
Chloroform	6.94	1.5
1,1,1-Trichloroethane	6.94	252.8
1,2-Dichloroethane	6.94	20.3
Benzene	6.94	1.1
Carbon Tetrachloride	6.94	0.0
Trichloroethene	6.94	199.6
Toluene	6.94	0.0
Tetrachloroethene	6.94	3.6

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-39-1 P128
Operator	MILLER	Lab #:	3117 A 1.D
Volume	200 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.1
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.4
t-1,2-Dichloroethene	0.75	0.0
Chloroform	0.75	0.1
1,1,1-Trichloroethane	0.75	37.3
1,2-Dichloroethane	0.75	2.4
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.1
Trichloroethene	0.75	11.5
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-39-2 P126
Operator MILLER Lab #: 3118A1.D
Volume 200 ml Date Ana 04/13/91

Canister	Initial:	700 Final:	700
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Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.1
Freon-11	0.75	0.3
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	0.7
t-1,2-Dichloroethene	0.75	0.1
Chloroform	0.75	0.2
1,1,1-Trichloroethane	0.75	30.0
1,2-Dichloroethane	0.75	1.8
Benzene	0.75	0.1
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	10.3
Toluene	0.75	0.0
Tetrachloroethene	0.75	0.4

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-61-2 P116
Operator	MILLER	Lab #:	3092A1.D
Volume	200 ml	Date Ana	04/13/91

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	Initial:		700
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Canister	11176767.	, oo i inai.	, 001

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	1.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	218.6
t-1,2-Dichloroethene	0.75	422.9
Chloroform	0.75	1.2
1,1,1-Trichloroethane	0.75	39.7
1,2-Dichloroethane	0.75	13.5
Benzene	0.75	1.0
Carbon Tetrachloride	0.75	0.3
Trichloroethene	0.75	215.4
Toluene	0.75	0.1
Tetrachloroethene	0.75	22.7

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-61-1
Operator MILLER Lab #: 3099A1.D
Volume 200 ml Date Ana 04/13/91

		700 Final:	
Canister	Initial:		700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	0.5
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	243.4
t-1,2-Dichloroethene	0.75	444.3
Chloroform	0.75	1.1
1,1,1-Trichloroethane	0.75	103.1
1,2-Dichloroethane	0.75	7.0
Benzene	0.75	0.7
Carbon Tetrachloride	0.75	0.2
Trichloroethene	0.75	184.2
Toluene	0.75	0.0
Tetrachloroethene	0.75	34.2

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	VR-AC-C-36-3
Operator	MILLER	Lab #:	3124A1.D
Volume	220 ml	Date Ana	04/13/91

Initial:	64	O Final:	1095
	MDL	Concentrat	ion
——————————————————————————————————————		ppbv	
	Initial:	MDL	MDL Concentrat ppbv

Compound	MDL	ppbv
Freon-12	0.68	0.0
Vinyl Chloride	0.68	0.0
Freon-11	0.68	0.0
c-1,2-Dichloroethene	0.68	0.0
1,1-Dichloroethane	0.68	2.5
t-1,2-Dichloroethene	0.68	0.6
Chloroform	0.68	0.5
1,1,1-Trichloroethane	0.68	156.0
1,2-Dichloroethane	0.68	10.5
Benzene	0.68	0.3
Carbon Tetrachloride	0.68	0.0
Trichloroethene	0.68	62.1
Toluene	0.68	0.1
Tetrachloroethene	0.68	1.7

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

	CH2M HILL	Location	MW-HDR-C-9-2 P117
Operator	MILLER	Lab #:	3107B1.D
Volume	200 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.00
Vinyl Chloride	0.75	0.00
Freon-11	0.75	54.85
1,1-Dichloroethene	0.75	0.00
Freon-113	0.75	306.00
Dichloromethane	0.75	6.42
1,1-Dichloroethane	0.75	1.40
1,2-Dichloroethene	0.75	0.55
Chloroform	0.75	0.53
1,1,1-Trichloroethane	0.75	16.11
1,2-Dichloroethane	0.75	1.22
Benzene	0.75	0.24
Carbon Tetrachloride	0.75	0.57
Trichloroethene	0.75	40.41
Toluene	0.75	0.10
Tetrachloroethene	0.75	1.80

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDRC-7-3 P10
Operator	MILLER	Lab #:	3114A1.D
Volume	200 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	140.4
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	1905.3
t-1,2-Dichloroethene	0.75	1005.9
Chloroform	0.75	16.2
1,1,1-Trichloroethane	0.75	64.2
1,2-Dichloroethane	0.75	168.5
Benzene	0.75	59.4
Carbon Tetrachloride	0.75	0.0
Trichloroethene	0.75	121.1
Toluene	0.75	2.0
Tetrachloroethene	0.75	48.1

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client: CH2M HILL Location VR-AC-C-36-2
Operator MILLER Lab #: 3123A1.D
Volume 149 ml Date Ana 04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	1.01	0.0
Vinyl Chloride	1.01	0.7
Freon-11	1.01	0.9
c-1,2-Dichloroethene	1.01	0.0
1,1-Dichloroethane	1.01	3.6
t-1,2-Dichloroethene	1.01	1.7
Chloroform	1.01	0.6
1,1,1-Trichloroethane	1.01	118.0
1,2-Dichloroethane	1.01	8.2
Benzene	1.01	0.5
Carbon Tetrachloride	1.01	0.0
Trichloroethene	1.01	49.3
Toluene	1.01	0.0
Tetrachloroethene	1.01	0.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDRC-9-3 P12
Operator	MILLER	Lar #:	3116 A 1.D
Volume	190 ml	Date Ana	04/13/91

10001-60	T-i-i-1	• 700 Final	700
Canister	Initial	: 700 Final:	. /
320000			

Compound	MDL	Concentration ppbv
Freon-12	0.79	0.0
Vinyl Chloride	0.79	0.0
Freon-11	0.79	35.1
c-1,2-Dichloroethene	0.79	0.0
1,1-Dichloroethane	0.79	317.4
t-1,2-Dichloroethene	0.79	400.6
Chloroform	0.79	5.8
1,1,1-Trichloroethane	0.79	42.3
1,2-Dichloroethane	0.79	72.4
Benzene	0.79	24.8
Carbon Tetrachloride	0.79	0.8
Trichloroethene	0.79	110.2
Toluene	0.79	0.7
Tetrachloroethene	0.79	21.9

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDRC-9-4 P11	-
Operator	MILLER	Lab #:	3127A1.D	
Volume	200 ml	Date Ana	04/13/91	

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.75	0.0
Vinyl Chloride	0.75	0.0
Freon-11	0.75	14.2
c-1,2-Dichloroethene	0.75	0.0
1,1-Dichloroethane	0.75	3.9
t-1,2-Dichloroethene	0.75	3.9
Chloroform	0.75	0.5
1,1,1-Trichloroethane	0.75	16.1
1,2-Dichloroethane	0.75	2.2
Benzene	0.75	0.7
Carbon Tetrachloride	0.75	0.6
Trichloroethene	0.75	153.8
Toluene	0.75	0.1
Tetrachloroethene	0.75	2.3

Close Support Laboratory, CH2M Hill McClellan AFB

EPA Method TO-14: GC/MS Full Scan

Client:	CH2M HILL	Location	MW-HDR-7-2
Operacor	MILLER	Lab #:	3105A1.D
Volume	159 ml	Date Ana	04/13/91

Canister	Initial:	700 Final:	700

Compound	MDL	Concentration ppbv
Freon-12	0.94	0.0
Vinyl Chloride	0.94	0.0
Freon-11	0.94	104.7
c-1,2-Dichloroethene	0.94	0.0
1,1-Dichloroethane	0.94	3493.6
t-1,2-Dichloroethene	0.94	3415.7
Chloroform	0.94	29.2
1,1,1-Trichloroethane	0.94	180.6
1,2-Dichloroethane	0.94	441.6
Benzene	0.94	152.9
Carbon Tetrachloride	0.94	0.0
Trichloroethene	0.94	1523.2
Toluene	0.94	2.8
Tetrachloroethene	0.94	80.5



Sacramento Office

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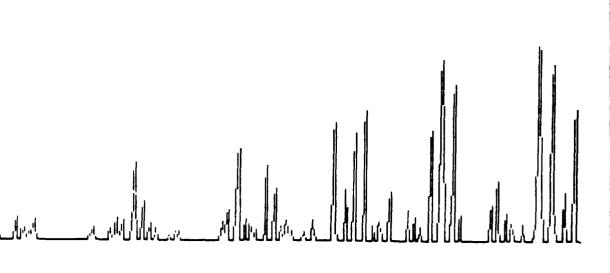
TO _STE	DATE 5/6/91
	MENTAL ANALTICAL SEIZUICE RE: MICHIELLAN GUALITY CONTROL
	GEANADA REPORT
Į	US CB. SPC CA 93401
	OUR PROJECT NO. SAC 25727.03.02
	WE ARE SENDING THE FOLLOWING MATERIAL TO YOU
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SECTION IV OFFSITE DATA



Environmental Analytical Service

ANALYTICAL REPORT
Section 2
McClellan AFB
Off-Site Laboratory
March 20 - April 12, 1991



ANALYTICAL REPORT

Section 2
McClellan AFB
Off-Site Laboratory
March 20 - April 12, 1991

Prepared for:

CH₂M Hill

Prepared by:

Steven D. Hoyt, Ph.D.

ENVIRONMENTAL ANALYTICAL SERVICE, INC.
170 Granada, Suite C
San Luis Obispo, California 93401
Phone (805) 541-3666 FAX (805) 541-4550

SECTION 2

4.0 ANALYTICAL RESULTS, BATCH BLANKS AND DUPLICATES

This section of the report contains all of daily batches of analysis preformed by Environmental Analytical Service for the off-site analytical portion of the McClellan Air Force Base Project.



METHOD BLANK REPORT

QC Lot:	3-22-91 Method:	EPA TO-14 -	GC/MS Full Scan
	Compound	MDL ppbv	Blank (ppbv)
	Freon 12	0.50	not detec
	Vinvl Chloride	0.50	not detec
	Freon 11	0.50	not detec
	1,1-Dichloroethene	0.50	not detec
	Dichloromethane	0.50	not detec
	Trichlorotrifluoroethane	0.50	not detec
	1,1-Dichloroethane	0.50	not detec
	c-1,2-Dichloroethene	0.50	not detec
	t-1,2-Dichloroethene	0.50	not detec
	Chloroform	0.50	not detec
	1,1.1-Trichloroethane	0.50	not detec
	1.2-Dichloroethane	0.50	not detec
	Benzene	0.50	not detec
	Carbon Tetrachloride	0.50	not detec
	Trichloroethene	0.50	not detec
	Toluene	0.50	not detec
	Tetrachloroethane	0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10252 Duplcte 10252 D

QC Lot: 3-22-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	29	28	5	40
Vinvl Chloride	not detec	not detec .	_	40
Freon 11	370	300	31	40
1.1-Dichloroethene	2200	1800	30	40
Dichloromethane	17	16	9	40
Trichlorotrifluoroethane	29000	21000	48	40
1.1-Dichloroethane	not detec	not detec		40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1.1.1-Trichloroethane	4.5	3.5	38	40
1,2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	29	23	35	40
Trichloroethene	25	19	41	40
Toluene	1.	1.1	36	40
Tetrachloroethane	not detec	not detec		40



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10251
Date Sampled: 3-20-91
Date Analyzed: 3-22-91 Site: MW-AC-0-004 Can #: 82

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	22	110
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	530	3000
1.1-Dichloroethene	0.75	3100	12000
Dichloromethane	0.75	30	100
Trichlorotriflouroethane	0.75	29000	220000
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	4.9	26
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	32	200
Trichloroethene	.0.75	31	170
Toluene	0.75	0.95	3.6
Tetrachloroethene	0.75	0.85	5.8



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10252
Site: MW-B-0-005 Date Sampled: 3-20-91
Can #: Bag Date Analyzed: 3-22-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	29	140	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	370	2100	
1-Dichloroethene	0.75	2200	8600	
hloromethane	0.75	17	60 ·	
chlorotriflouroethane	0.75	29000	220000	
1.1-Dichloroethane	0.75	not detected	not detected	
c-1,2-Dichloroethene	0.75	not detected	not detected	
t-1,2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1,1,1-Trichloroethane	0.75	4.5	25	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	29	180	
Trichloroethene	0.75	25	140	
Toluene	0.75	1.4	5.1	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10252 D
Date Sampled: 3-20-91
Date Analyzed: 3-22-91 Site: MW-B-0-005 Can #: Bag

Can 9. Das		Jete Himiyees. J-22-71		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	28	140	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	300	1700	
1.1-Dichloroethene	0.75	1800	7300	
Dichloromethane	0.75	16	55	
Trichlorotriflouroethane	0.75	21000	160000	
1.1-Dichloroethane	0.75	not detected	not detected	
1,2-Dichloroethene	0.75	not detected	not detected	
-1.2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	3.5	19	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	23	140	
Trichloroethene	0.75	19	100	
Toluene	0.75	1.1	4.1	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-010 Lab #: 10254
Date Sampled: 3-20-91
Date Analyzed: 3-22-91

Can #: 127		•	zed: 3-22-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	10	50
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	340	1900
1.1-Dichloroethene	0.75	2900	11000
Dichloromethane	0.75	52	180
Trichlorotriflouroethane	0.75	28000	210000
1.1-Dichloroethane	0.75	not detected	not detected
c-l.2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	4.4	24
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	30	190
Trichloroethene	0.75	27	150
Toluene	0.75	not detected	not detected
Tetrachi oroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10255

 Site:
 MW-B-0-011
 Date Sampled:
 3-20-91

 Can #:
 Bag
 Date Analyzed:
 3-22-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	12	58	
Vinvl Chloride	0.75	not detected	not detected	
Freon 11	0.75	460	2600	
1.1-Dichloroethene	0.75	2600	10000	
Dichloromethane	0.75	41	140	
Trichlorotriflouroethane	0.75	25000	190000	
1.1-Dichloroethane	0.75	1.4	5.6	
c-1.2-Dichloroethene	0.75	not detected	not detected	
-1.2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	4.7	26	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	28	180	
Trichloroethene	0.75	25	130	
Toluene	0.75	1.3	4.9	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10257
Date Sampled: 3-20-91
Date Analyzed: 3-22-91 Client: CH2M Hill Site: MW-AC-0-016 Can #: 125

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	11	56	
Vinvl Chloride	0.75	not detected	not detected	
Freon 11	0.75	480	2700	
1.1-Dichloroethene	0.75	2500	9900	
Dichloromethane	0.75	41	140	
Trichlorotriflouroethane	0.75	25965	200000	
l,1-Dichloroethane	0.75	not detected	not detected	
c-1,2-Dichloroethene	0.75	not detected	not detected	
t-1,2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	4.9	26	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Tembon Tetrachloride	0.75	34	210	
loroethene	0.75	31	160	
ne	0.75	not detected	not detected	
.corachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-017 Lab #: 10258

Date Sampled: 3-20-91
Date Analyzed: 3-22-91 Can #: Bag

July 1005				
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	not detected	not detected	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	290	1700	
1.1-Dichloroethene	0.75	25000	98000	
Dichloromethane	0.75	73	250	
Trichlorotriflouroethane	0.75	520	4000	
1.1-Dichloroethane	0.75	not detected	not detected	
-1.2-Dichloroethene	0.75	not detected	not detected	
:-1,2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	2.5	14	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	17	110	
Trichloroethene	0.75	14	76	
Toluene	0.75	4.5	17	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10260
Date Sampled: 3-20-91
Date Analyzed: 3-22-91 Client: CH2M Hill Site: MW-AC-0-020 Can #: 83

Compound	MDL ppbv	Concentration ppbv	Concentration	
	- ppov	hha	ug/m3	
Freon 12	0.75	not detected	not detected	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	not detected	not detected	
1.1-Dichloroethene	0.75	not detected	not detected	
Dichloromethane	0.75	1.6	5.5	
Trichlorotriflouroethane	0.75	not detected	not detected	
1.1-Dichloroethane	0.75	not detected	not detected	
c-1,2-Dichloroethene	0.75	not detected	not detected	
t-1.2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	not detected	not detected	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	not detected	not detected	
Trichloroethene	0.75	not detected	not detected	
Toluene	0.75	not detected	not detected	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10261
Date Sampled: 3-20-91
Date Analyzed: 3-22-91 Client: CH2M Hill Site: MW-B-0-021

Can #: Bag

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	0.85	4.2	
Vinvl Chloride	0.75	not detected	not detected	
Freon 11	0.75	not detected	not detected	
1.1-Dichloroethene	0.75	not detected	not detected	
Dichloromethane	0.75	2.3	7.9	
Trichlorotriflouroethane	0.75	7. 9	60	
1.1-Dichloroethane	0.75	not detected	not detected	
c-1.2-Dichloroethene	0.75	not detected	not detected	
t-1.2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	not detected	not detected	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	not detected	not detected	
richloroethene	0.75	not detected	not detected	
foluene	0.75	not detected	not detected	
Tetrachloroethene	0.75	not detected	not detected	

ANALYTICAL RESULTS March 27, 1991



EPA Method TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill		Lab #:	10253
Site: MW-S-0-006		Date Sampled:	
Tube #: 2005		Date Analyzed:	3-27-91
Compound	MDL	Concentration	• • • • • • • • •
	ng	ng	
Freon 12	1.00	230	
'invl Chloride	1.00	25	
Freon 11	1.00	850	
1.1-Dichloroethene	1.00	2300	
Dichloromethane	1.00	16	
Trichlorotriflouroethane	1.00	3700	
1.1-Dichloroethane	1.00	not detected	
c-1.2-Dichloroethene	1.00	not detected	
t-1.2-Dichloroethene	1.00	not detected	
Chloroform	1.00	not detected	
l.l.l-Trichloroethane	1.00	4.9	
1.2-Dichloroethane	1.00	not detected	
Benzene	1.00	not detected	
Carbon Tetrachloride	1.00	5.3	
Trichloroethene	1.00	6.36	
Toluene	1.00	14	
Tetrachloroethene	1.00	not detected	



EPA	Method	TO-02:	GC/MS	Full	Scan

Toluene

Tetrachloroethene

Client: CH2M Hill Site: MW-S-0-012 Tube #: 1007		Lab #: 10256 Date Sampled: 3-20-91 Date Analyzed: 3-27-91
Compound	MDL ng	Concentration ng
Freon 12	1.00	7.0
Vinyl Chloride	1.00	not detected
Freon 11	1.00	1400
1,1-Dichloroethene	1.00	3600
Dichloromethane	1.00	15
Trichlorotriflouroethane	1.00	7600
1.1-Dichloroethane	1.00	not detected
c-1.2-Dichloroethene	1.00	not detected
t-1,2-Dichloroethene	1.00	not detected
Chloroform	1.00	not detected
1.1.1-Trichloroethane	1.00	25
1.2-Dichloroethane	1.00	not detected
Benzene	1.00	2.9
Carbon Tetrachloride	1.00	84
Trichloroethene	1.00	69

1.00

1.00

30 1.7



EPA Method TO-02: GC/MS Full Scan

Carbon Tetrachloride

Trichloroethene

Tetrachloroethene

Toluene

Client: CH2M Hill Site: MW-T-0-018 Tube #: 2003		Lab #: 10259 Date Sampled: 3-20-91 Date Analyzed: 3-27-91
Compound	MDL ng	Concentration ng
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotriflouroethane 1.1-Dichloroethane c-1.2-Dichloroethene t-1.2-Dichloroethene	1.00 1.00 1.00 1.00 1.00 1.00 1.00	9.0 not detected 8.6 7.4 73 56 not detected not detected not detected
Chloroform 1.1.1-Trichloroethane 1.2-Dichloroechane Benzene	1.00 1.00 1.00 1.00	not detected 3.5 not detected 1.3

not detected

not detected

not detected

39

1.00

1.00

1.00

1.00

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EPA S	fethod	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill Site: MW-S-0-022 Tube #: 1003		Lab #: 10262 Date Sampled: 3-20 Date Analyzed: 3-2	0-91
Compound	MDL ng	Concentration ng	
Freon 12	1.00	22	
Vinyl Chloride	1.00	not detected	
Freon 11	1.00	14	
1,1-Dichloroethene	1.00	not detected	
Dichloromethane	1.00	290	
Trichlorotriflouroethane	1.00	not detected	
1,1-Dichloroethane	1.00	not detected	
c-1.2-Dichloroethene	1.00	not detected	
t-1,2-Dichloroethene	1.00	not detected	
Chloroform	1.00	not detected	
1.1.1-Trichloroethane	1.00	15	
1.2-Dichloroethane	1.00	not detected	
Benzene	1.00	not detected	
Carbon Tetrachloride	1.00	not detected	
Trichloroethene	1.00	not detected	
Toluene	1.00	15	
Tetrachloroethene	1.00	not detected	

ANALYTICAL RESULTS
March 28, 1991



METHOD BLANK REPORT

QC Lot: 3-28-91	Method:	EPA TO-14	- GC/MS Full Scan
Compound		MDL ppbv	Blank (ppbv)
Freon 12 Vinyl Chloric Freon 11 1.1-Dichlorometha Trichlorotrif 1.1-Dichlorometha Trichlorotrif 1.1-Dichlorometha 1.1-Trichlorometha 1.1.1-Trichlorometha 1.2-Dichlorometha 1.2-Dichlorometha 1.2-Dichlorometha Trichlorometha Toluene Tetrachlorometha	ethene ine fluoroethane ethane coethene oroethane ethane ethane	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10284 D Duplcte: 10284

OC Lot: 3-28-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample Duplicate ppbv ppbv			QC Limits	
Freon 12	not detec	not detec		40	
Vinyl Chloride	not detec	not detec		40	
Freon 11	19	17	11	40	
l.l-Dichloroethene	270	260	4	40	
Dichloromethane	not detec	not detec		40	
Trichlorotrifluoroethane	11000	12000	9	40	
l.l-Dichloroethane	not detec	not detec		40	
c-1.2-Dichloroethene	not detec	not detec		40	
t-1,2-Dichloroethene	1.9	3.5	59	40	
Chloroform	0.91	1.1	19	40	
l.l.l-Trichloroethane	1.5	1.2	22	40	
1.2-Dichloroethane	not detec	not detec		40	
Benzene	1.1	0.92	18	40	
Carbon Tetrachloride	40	42	5	40	
Trichloroethene	110	110	0	40	
Toluene	1.6	1.4	13	40	
Tetrachloroethane	not detec	not detec		40	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10272
Date Sampled: 3-27-91
Date Analyzed: 3-28-91 Client: CH2M Hill Site: MW-PC-0-2-B Can #: 400

can #. 400		•	3-28-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
l.l-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	4.8	17
Trichlorotriflouroethane	0.75	11	86
1.1-Dichloroethane	0.75	not detected	not detected
c-l,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	3.8	12
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	4.9	19
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-2-B Can #: Bag Lab #: 10281
Date Sampled: 3-27-91
Date Analyzed: 3-28-91

Can #: Bag		Date Analy	rzed: 3-28-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	1.6	7.8
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	290	1600
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	15	53
Trichlorotriflouroethane	0.75	4.8	37
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	3.3	18
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	1.8	5.8
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	2.3	12
Toluene	0.75	38	140
etrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10282
Date Sampled: 3-27-91
Date Analyzed: 3-28-91 Site: MW-B-0-2-1 Can #: Bag

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	18	100
1.1-Dichloroethene	0.75	300	1200
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	12000	92000
1-Dichloroethane	0.75	not detected	not detected
1.2-Dichloroethene	0.75	not detected	not detected
2-1,2-Dichloroethene	0.75	1.9	7.4
Chloroform	0.75	not detected	not detected
l.l.l-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	42	260
Trichloroethene	0.75	110	610
Toluene	0.75	0.77	2.9
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10283
Date Sampled: 3-27-91
Date Analyzed: 3-28-91 Site: MW-B-0-2-2 Can #: Bag

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3		
Freon 12	0.75	not detected	not detected		
Vinyl Chloride	0.75	not detected	not detected		
Freon 11	0.75	12	65		
1.1-Dichloroethene	0.75	300	1200		
Dichloromethane	0.75	not detected	not detected		
Trichlorotriflouroethane	0.75	12000	91000		
1.1-Dichloroethane	0.75	not detected	not detected		
c-l.2-Dichloroethene	0.75	not detected	not detected		
t-1,2-Dichloroethene	0.75	2.5	10		
Chloroform	0.75	not detected	not detected		
1.1.1-Trichloroethane	0.75	1.1	6.1		
1.2-Dichloroethane	0.75	not detected	not detected		
Benzene	0.75	not detected	not detected		
Carbon Tetrachloride	0.75	51	320		
Trichloroethene	0.75	130	720		
Toluene	0.75	1.8	6.7		
Tetrachloroethene	0.75	not detected	not detected		



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-2-3 Can #: Bag Lab #: 10284
Date Sampled: 3-27-91
Date Analyzed: 3-28-91

Can #: Bag		Date Anal	yzed: 3-28-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	17	95
1.1-Dichloroethene	0.75	260	1000
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	12000	90000
l.l-Dichloroethane	0.75	not detected	not detected
c-l.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	3.5	14
Chloroform	0.75	1.1	5.1
1.1.1-Trichloroethane	0.75	1.2	6.7
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	0.92	2.9
Carbon Tetrachloride	0.75	42	260
Trichloroethene	0.75	110	620
Toluene	0.75	1.4	5.3
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client: CH2M Hill
 Lab #: 10284 D

 Site: MW-B-0-2-3
 Date Sampled: 3-27-91

 Can #: Bag
 Date Analyzed: 3-28-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	19	110
1.1-Dichloroethene	0.75	270	1100
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	11000	83000
1,1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	1.9	7.6
Chloroform	0.75	0.91	4.4
1.1.1-Trichloroethane	0.75	1.5	7.9
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	1.1	3.5
Carbon Tetrachloride	0.75	40	250
Trichloroethene	0.75	110	560
Toluene	0.75	1.6	6.1
Tetrachloroethene	0.75	not detected	not detected

ANALYTICAL RESULTS March 29, 1991



METHOD BLANK REPORT

QC Lot: 3-29-91 Method:	EPA TO-14	- GC/MS Full Scan
Compound	MDL ppbv	Blank (ppbv)
Freon 12	0.50	not detec
Vinyl Chloride	0.50	not detec
Freon 11	0.50	not detec
1.1-Dichloroethene	0.50	not detec
Dichloromethane	0.50	not detec
Trichlorotrifluoroethane	0.50	not detec
1.1-Dichloroethane	0.50	not detec
c-1,2-Dichloroethene	0.50	not detec
t-1,2-Dichloroethene	0.50	not detec
Chloroform	0.50	not detec
1,1,1-Trichloroethane	0.50	not detec
1,2-Dichloroethane	0.50	not detec
Benzene	0.50	not detec
Carbon Tetrachloride	0.50	not detec
Trichloroethene	0.50	not detec
Toluene	0.50	not detec
Tetrachloroethane	0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10293 Duplote: 10293 D

QC Lot: 3-29-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec		40
1,1-Dichloroethene	not detec	not detec		40
Dichloromethane	not detec	not detec		40
Trichlorotrifluoroethane	not detec	not detec	16	40
1,1-Dichloroethane	not detec	not detec		40
c-l,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	not detec	not detec		40
1.2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	not detec	not detec	5	40
Trichloroethene	not detec	not detec	31	40
Toluene	not detec	not detec		40
Tetrachloroethane	not detec	not detec		40



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10291

 Site:
 MW-B-0-3-1
 Date Sampled:
 3-28-91

 Can #:
 Bag
 Date Analyzed:
 3-29-91

-		• • • • • • • • • • • • • • • • • • • •		
MDL ppbv	Concentration ppbv	Concentration ug/m3		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	90	310		
0.75	4500	35000		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	not detected	not detected		
0.75	9.0	57		
0.75	8.5	46		
0.75	not detected	not detected		
0.75	not detected	not detected		
	MDL ppbv 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75	ppbv ppbv 0.75 not detected 0.75 not detected 0.75 not detected 0.75 90 0.75 4500 0.75 not detected 0.75 9.0 0.75 8.5 0.75 not detected		



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10292 Site: MW-B-0-3-2 Date Sampled: 3-28-91

Can #:			Date Analy	ed: 3-28-91 zed: 3-29-91
Compour	nd	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12)	0.75	not detected	not detected
Vinyl Ch	loride	0.75	not detected	not detected
Freon 11	•	0.75	not detected	not detected
1.1-Dich	loroethene	0.75	not detected	not detected
Dichloro	methane	0.75	not detected	not detected
Trichlor	otriflouroethane	0.75	2500	20000
1.1-Dich	loroethane	0.75	not detected	not detected
c-1.2-Di	chloroethene	0.75	not detected	not detected
t-1.2-Di	chloroethene	0.75	not detected	not detected
Chlorofo	rm	0.75	not detected	not detected
1.1.1-Tr	richloroethane	0.75	not detected	not detected
1.2-Dich	nloroethane	0.75	not detected	not detected
Benzene		0.75	not detected	not detected
Carbon I	Tetrachloride	0.75	7.4	47
Trichlor	oethene	0.75	11	60
Toluene		0.75	not detected	not detected
Tetrachl	oroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10293

 Site:
 MW-B-0-3-3
 Date Sampled:
 3-28-91

 Can #:
 Bag
 Date Analyzed:
 3-29-91

Compound	MDL	Concentration	Concentration
	bbpA	ppbv	ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	2700	21000
-Dichloroethane	0.75	not detected	not detected
2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	7.4	46
Trichloroethene	0.75	8.8	47
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10293 D

 Site:
 MW-B-0-3-3
 Date Sampled:
 3-28-91

 Can #:
 Bag
 Date Analyzed:
 3-29-91

Can 7. Dag		Date .maryced. J-27-71		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	not detected	not detec	
Vinyl Chloride	0.75	not detected	not detec	
Freon 11	0.75	not detected	not detec	
1.1-Dichloroethene	0.75	not detected	not detec	
Dichloromethane	0.75	not detected	not detec	
Trichlorotriflouroethane	0.75	2300	18000	
1.1-Dichloroethane	0.75	not detected	not detec	
c-l,2-Dichloroethene	0.75	not detected	not detec	
t-1,2-Dichloroethene	0.75	not detected	not detec	
Chloroform	0.75	not detected	not detec	
1.1.1-Trichloroethane	0.75	not detected	not detec	
1,2-Dichloroethane	0.75	not detected	not detec	
Senzene	0.75	not detected	not detec	
Carbon Tetrachloride	0.75	7.8	49	
Trichloroethene	0.75	12	67	
Toluene	0.75	not detected	not detec	
Tetrachloroethene	0.75	not detected	not detec	



EPA Method TO-14: GC/MS Full Scan

 Client: CH2M Hill
 Lab #: 10294

 Site: MW-B-0-3-3 (Dup)
 Date Sampled: 3-28-91

 Can #: Bag
 Date Analyzed: 3-29-91

Jen - , De5		5000	, 200.
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
l.l-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	2000	15000
1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1,1,1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	7.5	47
Trichloroethene	0.75	11	62
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10295
Date Sampled: 3-28-91
Date Analyzed: 3-29-91 Client: CH2M Hill

Site: MW-B-0-3-B Can #: Bag

		yzed: 3-29-91
MDL ppbv	Concentration ppbv	Concentration ug/m3
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	6.1	21
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	not detected	not detected
0.75	2.5	9.5
0.75	not detected	not detected
	MDL ppbv 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.7	MDL ppbv ppbv O.75 not detected

ANALYTICAL RESULTS March 30, 1991



METHOD BLANK REPORT

QC Lot:	3-30-91 Meth	nod: EPA TO-14	- GC/MS Full	Scan
	Compound	MDL ppbv		ank bv)
•	Freon 12	0.50		detec
	Vinyl Chloride	0.50		detec
	Freon 11	0.50	not	detec
	1.1-Dichloroethene	0.50	not	detec
	Dichloromethane	0.50	not	detec
	Trichlorotrifluoroeth	iane 0.50	not	detec
	1,1-Dichloroethane	0.50	not	detec
	c-1.2-Dichloroethene	0.50	not	detec
	t-1,2-Dichloroethene	0.50	not	detec
	Chloroform	0.50	not	detec
	1.1.1-Trichloroethane	0.50	not	detec
	1.2-Dichloroethane	0.50	not	detec
	Benzene	0.50	not	detec
	Carbon Tetrachloride	0.50	not	detec
	Trichloroethene	0.50	not	detec
	Toluene	0.50	not	detec
	Tetrachloroethane	0.50		detec



METHOD BLANK REPORT

QC Lot:	3-30-91 Meth		GC/MS Full Scan
•••••	Compound	MDL ppbv	Blank (ppbv)
	Freon 12	0.50	not detec
	Vinyl Chloride	0.50	not detec
	Freon 11	0.50	not detec
	1.1-Dichloroethene	0.50	not detec
	Dichloromethane	0.50	not detec
	Trichlorotrifluoroeti	name 0.50	not detec
	1.1-Dichloroethane	0.50	not detec
	c-1,2-Dichloroethene	0.50	not detec
	t-1,2-Dichloroethene	0.50	not detec
	Chloroform	0.50	not detec
	1,1,1-Trichloroethane	0.50	not detec
	1,2-Dichloroethane	0.50	not detec
	Benzene	0.50	not detec
	Carbon Tetrachloride	0.50	not detec
	Trichloroethene	0.50	not detec
	Toluene	0.50	not detec
	Tetrachloroethane	0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10273 Duplote: 10273 D

QC Lot: 3-30-91 Method: EPA TO-14 - GC/MS Full Scan

Co mpound	Sample ppbv	Duplicate ppbv	RPD	QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec	27	40
1.1-Dichloroethene	not detec	not detec	40	40
Dichloromethane	not detec	not detec		40
Trichlorotrifluoroethane	not detec	not detec	34	40
l.l-Dichloroethane	not detec	not detec		40
:-1.2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec	14	40
Chloroform	not detec	not detec		40
l.l.l-Trichloroethane	not detec	not detec		40
1.2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec	4	40
Carbon Tetrachloride	not detec	not detec	10	40
Trichloroethene	not detec	not detec	10	40
Toluene	not detec	not detec	16	40
Tetrachloroethane	not detec	not detec		40



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10273 Duplcte: 10273 D

OC Lot: 3-30-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec	27	40
1.1-Dichloroethene	not detec	not detec	40	40
Dichloromethane	not detec	not detec		40
Trichlorotrifluoroethane	not detec	not detec	34	40
1.1-Dichloroethane	not detec	not detec		40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec	14	40
Chloroform	not detec	not detec		40
1.1,1-Trichloroethane	not detec	not detec		40
1.2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec	4	40
Carbon Tetrachloride	not detec	not detec	10	40
Trichloroethene	not detec	not detec	10	40
Toluene	not detec	not detec	16	40
Tetrachloroethane	not detec	not detec		40



EPA Method TO-14: GC/MS Full Scan	an	L S	Ful	GC/MS	TO-14:	Method	EPA
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Client: CH2M Hill Lab #: 10273
Site: MW-PC-0-2-1 Date Sampled: 3-28-91
Can #: 91 Date Analyzed: 3-30-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	38	210
1.1-Dichloroethene	0.75	140	570
Dichloromethane	0.75	not detected	not detected
richlorotriflouroethane	0.75	3400	26000
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	1.3	5.1
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	2.9	9.1
Carbon Terrachloride	0.75	31	190
Trichloroethene	0.75	86	460
Toluene	0.75	7.3	28
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14:	GC/MS Full	. Scan
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 Client:
 CH2M Hill
 Lab #:
 10273 D

 Site:
 MW-PC-0-2-1
 Date Sampled:
 3-28-91

 Can #:
 91
 Date Analyzed:
 3-30-91

Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	29	170
1.1-Dichloroethene	0.75	93	370
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	2400	19000
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
1.2-Dichloroethene	0.75	1.5	5.9
loroform	0.75	not detected	not detected
l.l-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	2.8	9.0
Carbon Tetrachloride	0.75	28	170
Trichloroethene	0.75	78	420
Toluene	0.75	6.2	23
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-PC-0-2-2 Can #: 79 Lab #: 10274
Date Sampled: 3-28-91
Date Analyzed: 3-30-91

		Jeco individua.	
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	19	93
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	27	150
1.1-Dichloroethene	0.75	110	440
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	2500	19000
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	0.98	3.9
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	2.9	9.3
Carbon Tetrachloride	0.75	19	120
Trichloroethene	0.75	55	300
Toluene	0.75	7.3	28
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #: 10296

 Site:
 MW-AC-0-3-1
 Date Sampled: 3-28-91

 Can #: 16
 Date Analyzed: 3-30-91

			Zeu. J-30-91
Compound	MDL p pbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	110	370
Trichlorotriflouroethane	0.75	830	6400
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	5.1	32
Trichloroethene	0.75	9.5	51
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	2.0	13



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10297
Site: MW-AC-0-3-2 Date Sampled: 3-28-91
Can #: 69 Date Analyzed: 3-30-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	not detected	not detected	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	not detected	not detected	
1,1-Dichloroethene	0.75	not detected	not detected	
Dichloromethane	0.75	88	310	
Trichlorotriflouroethane	0.75	660	5100	
l.l-Dichloroethane	0.75	not detected	not detected	
c-1.2-Dichloroethene	0.75	not detected	not detected	
t-1.2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1,1.1-Trichloroethane	0.75	not detected	not detected	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	3.7	23	
Trichloroethene	0.75	11	60	
Toluene	0.75	not detected	not detected	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10298

 Site:
 MW-AC-0-3-3
 Date Sampled:
 3-28-91

 Can #:
 123
 Date Analyzed:
 3-30-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	140	490
Trichlorotriflouroethane	0.75	670	5100
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	5.3	33
Trichloroethene	0.75	9.4	50
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10299
Site: MW-AC-0-3-B Date Sampled: 3-28-91
Can #: 52 Date Analyzed: 3-30-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
B 13			
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	7.5	26
Trichlorotriflouroethane	0.75	not detected	not detected
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	0.80	3.0
Tetrachloroethene	0.75	not detected	not detected

ANALYTICAL RESULTS April 1, 1991



METHOD BLANK REPORT

QC Lot:	4-1-91 Met	nod: EPA TO-14 -	GC/MS Full Scan
	Compound	MDL ppbv	Blank (ppbv)
	Freon 12	0.50	not detec
	Vinyl Chloride Freon 11	0.50 0.50	not detec not detec
	1.1-Dichloroethene	0.50	not detec
	Dichloromethane Trichlorotrifluoroeth	2.00 name 0.50	not detec not detec
	1.1-Dichloroethane	0.50	not detec
	c-1.2-Dichloroethene t-1.2-Dichloroethene		not detec not detec
	Chloroform 1.1.1-Trichloroethane	0.50 a 0.50	not detec
	1.2-Dichloroethane	0.50	not detec not detec
	Benzene Carbon Tetrachloride	0.50 0.50	not detec
	Trichloroethene	0.50	not detec not detec
	Toluene Tetrachloroethane	0.50 0.50	not detec not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10275 Duplcte: 10275 D

QC Lot: 4-1-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		30
Vinyl Chloride	not detec	not detec		30
Freon 11	49	60	20	30
l.l-Dichloroethene	280	270	4	30
Dichloromethane	not detec	not detec		30
[richlorotrifluoroethane	12000	13000	8	30
l.l-Dichloroethane	not detec	not detec		30
:-1,2-Dichloroethene	not detec	not detec		30
:-1.2-Dichloroethene	3.0	2.7	11	30
Chloroform	not detec	not detec		30
1.1.1-Trichloroethane	not detec	not detec		30
1.2-Dichloroethane	not detec	not detec		30
Benzene	not detec	not detec		30
Carbon Tetrachloride	61	64	5	30
Trichloroethene	170	170	0	30
Toluene ·	not detec	not detec		30
Tetrachloroethane	not detec	not detec		30



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10275

 Site:
 MW-PC-0-2-3
 Date Sampled:
 3-27-91

 Can #:
 61
 Date Analyzed:
 4-1-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	49	280
1.1-Dichloroethene	0.75	280	1100
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	12000	89000
1,1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
1,2-Dichloroethene	0.75	3.0	12
hloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	61	390
Trichloroethene	0.75	170	910
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10275 D
Site: MW-PC-0-2-3 Date Sampled: 3-27-91
Can #: 61 Date Analyzed: 4-1-91

Can #: 61		Date Anal	yzed: 4-1-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	60	340
1.1-Dichloroethene	0.75	270	1100
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	13000	11000
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
- 1.2-Dichloroethene	0.75	2.7	11
oroform	0.75	not detected	not detected
11-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	64	410
Trichloroethene	0.75	170	920
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10276
Date Sampled: 3-27-91
Date Analyzed: 4-1-91 Client: CH2M Hill Site: MW-PC-0-2-3 (Dup) Can #: 122

Can #: 122		Date Allary	28u. 4-1-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	39	220
1,1-Dichloroethene	0.75	200	790
Dichloromethane	0.75	not detected	not detected
[richlorotriflouroethane	0.75	15000	110000
1,1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	3.6	14
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	87	550
Trichloroethene	0.75	240	1300
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected

ANALYTICAL RESULTS April 3, 1991



METHOD BLANK REPORT

QC Lot:	4-3-91 Method:	EPA TO-14	- GC/MS Full Scan
•••••	Compound	MDL ppbv	Blank (ppbv)
		PPO+	(pp)
	Freon 12	0.50	not detec
	Vinvl Chloride	0.50	not detec
	Freon 11	0.50	not detec
	1.1-Dichloroethene	0.50	not detec
	Dichloromethane	2.00	not detec
	Trichlorotrifluoroethane	0.50	not detec
	1.1-Dichloroethane	0.50	not detec
	c-1,2-Dichloroethene	0.50	not detec
	t-1,2-Dichloroethene	0.50	not detec
	Chloroform	0.50	not detec
	1,1,1-Trichloroethane	0.50	not detec
	1,2-Dichloroethane	0.50	not detec
	Benzene	0.50	not detec
	Carbon Tetrachloride	0.50	not detec
	Trichloroethene	0.50	not detec
	Toluene	0.50	not detec
	Tetrachloroethane	0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10328 Duplote: 10328D QC Lot: 4-3-91

Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv	z RPD	QC Limits
Freon 12	230	260	12	40
Vinyl Chloride	2300	2800	20	40
Freon 11	170	230	30	40
1.1-Dichloroethene	42000	62000	38	40
Dichloromethane	120	190	45	_
Trichlorotrifluoroethane	20 000	26000	26	40
1,1-Dichloroethane	2300	2700	16	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	460	360	24	40
Chloroform	28	29	4	40
1.1.1-Trichloroethane	140	140	Ó	40
1.2-Dichloroethane	360	440	20	40
Benzene	110	120	9	40
Carbon Tetrachloride	not detec	not detec	•	40
Trichloroethene	6900	7600	10	40
Toluene	not detec	not detec		40
Tetrachloroethane	160	170	6	40
			•	. •



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10327
Date Sampled: 4-2-91
Date Analyzed: 4-3-91 Site: MW-AC-0-7-1 Can #: 05

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	5.00	280	1400
Vinyl Chloride	5.00	2300	5800
Freon 11	5.00	120	680
1.1-Dichloroethene	5.00	38000	150000
Dichloromethane	5.00	150	520
Trichlorotriflouroethane	5.00	14000	110000
1.1-Dichloroethane	5.00	1700	6800
·1,2-Dichloroethene	5.00	not detected	not detected
-1.2-Dichloroethene	5.00	380	1500
Chloroform	5.00	20	9 8
1.1.1-Trichloroethane	5.0 0	120	680
1,2-Dichloroethane	5.00	360	1500
Benzene	5.00	9 8	310
Carbon Tetrachloride	5.00	not detected	not detected
Trichloroethene	5.00	6700	36000
Toluene	5.00	not detected	not detected
Tetrachloroethene	5.00	140	970



EPA Method TO-14: GC/MS Full Scan

Lab #: 10328
Date Sampled: 4-2-91
Date Apalyzed: 4-3-91 Client: CH2M Hill Site: MW-AC-0-7-2

		zed: 4-3-91
MDL ppbv	Concentration ppbv	Concentration ug/m3
5.00	230	1100
5.00	2300	60 00
5.00	170	940
5.00	42000	170000
5.00	120	401
5.00	20000	150000
5.00	2300	9500
5.00	not detected	not detected
5.00	460	1800
5.00	28	130
5.00	140	750
5.00	360	1500
5.00	110	340
5.00	not detected	not detected
5.00	6900	37000
5.00	not detected	not detected
5.00	160	1100
	MDL ppbv 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.0	MDL Concentration ppbv ppbv 5.00 230 5.00 2300 5.00 170 5.00 42000 5.00 120 5.00 20000 5.00 2300 5.00 2300 5.00 24000 5.00 360 5.00 360 5.00 360 5.00 110 5.00 not detected 5.00 for detected 5.00 not detected 5.00 not detected 5.00 not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10328 D
Date Sampled: 4-2-91
Date Analyzed: 4-3-91 Client: CH2M Hill

Site: MW-AC-0-7-2 Can #: 18

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	5.00	260	1300
Vinyl Chloride	5.00	2800	7100
Freon 11	5.00	230	1300
1,1-Dichloroethene	5.00	62000	250000
Dichloromethane	5.00	190	660
Trichlorotriflouroethane	5.00	26000	20 000
1,1-Dichloroethane	5.00	2700	11000
1,2-Dichloroethene	5.00	not detected	not detected
-1,2-Dichloroethene	5.00	360	1400
hloroform	5.00	29	140
1,1,1-Trichloroethane	5.00	140	790
1,2-Dichloroethane	5.00	440	1800
Benzene	5.00	120	380
Carbon Tetrachloride	5.00	not detected	not detected
Trichloroethene	5.00	7600	41000
Toluene	5.00	not detected	not detected
Tetrachloroethene	5.00	170	1200



EPA Method TO-14: GC/MS Full Scan

Lab #: 10329
Date Sampled: 4-2-91
Date Analyzed: 4-3-91 Client: CH2M Hill Site: MW-AC-0-7-3

n /: 45		Date Anal	yzed: 4-3-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	5.00	not detected	not detected
Vinyl Chloride	5.00	2200	5600
Freon 11	5.00	160	900
l,l-Dichlorsethene	5.00	36000	140000
Dichloromethane	5.00	110	380
Trichlorotriflouroethane	5.00	18000	140000
1.1-Dichloroethane	5.00	2200	90 00
c-1,2-Dichloroethene	5.00	8.2	33
t-1,2-Dichloroethene	5.00	440	1800
Chloroform	5.00	26	130
1,1,1-Trichloroethane	5.00	140	740
1.2-Dichloroethane	5.00	380	1500
Benzene	5.00	100	330
Carbon Tetrachloride	5.00	18	110
Trichloroethene	5.00	3800	37000
Toluene	5.00	not detected	not detected
Tetrachloroethene	5.00	160	1100



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10330
Site: MW-AC-0-7-B Date Sampled: 4-2-91
Can #: 36 Date Analyzed: 4-3-91

Can #: 36		•	yzed: 4-3-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride.	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
l, l-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	15	51
Trichlorotriflouroethane	0.75	not detected	not detected
l, l-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1,1-Trichloroethane	0.75	not detected	not detected
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	3.1	11
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC, MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10331

 Site:
 MW-B-0-7-1
 Date Sampled:
 4-2-91

 Can #:
 Bag
 Date Analyzed:
 4-3-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	7.50	250	1200
Vinyl Chloride	7.50	2300	5800
Freon 11	7.50	110	600
1,1-Dichloroethene	7.50	37000	230000
Dichloromethane	7.50	150	540
Trichlorotriflouroethane	7.50	29000	220000
l.1-Dichloroethane	7.50	3500	14000
c-1,2-Dichloroethene	7.50	not detected	not detected
t-1,2-Dichloroethene	7.50	610	2400
Chloroform	7.50	37	180
.1.1-Trichloroethane	7.50	170	940
2-Dichloroethane	7.50	480	1900
Benzene	7.50	140	450
Carbon Tetrachloride	7.50	not detected	not detected
Trichloroethene	7.50	9200	50000
Toluene	7.50	not detected	not detected
Tetrachloroethene	7.50	180	1200



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10332

 Site:
 MW-B-0-7-2
 Date Sampled:
 4-2-91

 Can #:
 Bag
 Date Analyzed:
 4-3-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	62	350
1.1-Dichloroethene	1.50	30000	120000
Dichloromethane	1.50	15	52
Trichlorotriflouroethane	1.50	16000	120000
1.1-Dichloroethane	1.50	2600	10000
c-1,2-Dichloroethene	1.50	9. 9	39
7-1,2-Dichloroethene	1.50	450	1800
Chloroform	1.50	30	150
1,1,1-Trichloroethane	1.50	140	770
1,2-Dichloroethane	1.50	330	1400
Benzene	1.50	83	260
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	4900	26000
Toluene	1.50	4.6	17
Tetrachloroethene	1.50	100	680



EPA Method TO-14: GC/MS Full Scan

 Client:
 JH2M Hill
 Lab #:
 10333

 Site:
 MW-B-0-7-3
 Date Sampled:
 4-2-91

 Can #:
 Bag
 Date Analyzed:
 4-3-91

can /. Dag		pate mai	y 2 eu . 4 · 3 · 9 1
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	7 . 50	54	270
Vinyl Chloride	7.50	1200	3200
Freon 11	7.50	150	830
1.1-Dichloroethene	7.50	54000	210000
Dichloromethane	7.50	91	320
Trichlorotriflouroethane	7.50	27000	210000
1,1-Dichloroethane	7.50	3100	13000
c-1,2-Dichloroethene	7.50	not detected	not detected
t-1,2-Dichloroethene	7.50	610	2400
Chloroform	7.50	37	180
1,1,1-Trichloroethane	7.50	170	950
1.2-Dichloroethane	7.50	450	1800
Benzene	7.50	140	440
Carbon Tetrachloride	7.50	not detected	not detected
Trichloroethene	7.50	8900	48000
Toluene	7.50	9.8	37
Tetrachloroethene	7.50	180	1200



EPA Method TO-14: GC/MS Full Scan

Lab #: 10334
Date Sampled: 4-2-91
Date Analyzed: 4-3-91 Client: CH2M Hill Site: MW-B-0-7-4

Can #: Bag

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	180	910
Vinyl Chloride	3.75	180	450
Freon 11	3.75	270	1500
1,1-Dichloroethene	3.75	60000 ·	240000
Dichloromethane	3.75	160	560
Trichlorotriflouroethane	3.75	23000	170000
1,1-Dichloroethane	3.75	1300	5400
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	120	500
Chloroform	3.75	15	72
1,1,1-Trichloroethane	3.75	32	170
1,2-Dichloroethane	3.75	91	370
Benzene	3.75	27	87
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	3400	18000
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	56	380



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10335

 Site:
 MW-B-0-7-B
 Date Sampled:
 4-2-91

 Can #:
 Bag
 Date Analyzed:
 4-3-91

Can #: Bag		Date Analy	zed: 4-3-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
l.l-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	5.3	18
Trichlorotriflouroethane	0.75	not detected	not detected
1,1-Dichloroethane	0.75	not detected	not detected
c-l,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
l.l.l-Trichloroethane	0.75	not detected	not detected
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected

ANALYTICAL RESULTS April 4, 1991



EPA Method TO-02: GC/MS Full Scan

Client: CH2M Hill Lab #: 10277 Date Sampled: 3-27-91
Date Analyzed: 4-4-91

Site: MW-S-0-2-B Tube #: 1009

Tube #: 1009		Date Analyzed: 4-4-91	
Compound	MDL ug	Concentration ug	
Freon 12	0.001	0.103	••••
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.0573	
l,l-Dichloroethene	0.001	0.004	
Dichloromethane	0.001	0.050	
Trichlorotriflouroethane	0.001	not detected	
1,1-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1,1,1-Trichloroethane	0.001	0.007	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.004	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	0.016	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: (GC/MS Full Scan
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Client:	CH2M Hill	Lab #:	10278
Site:	MW-T-0-2-1	Date Sampled:	3-27-91
Tube #:	2015	Date Analyzed:	4-4-91

Compound	MDL	Concentration
	ug	ug
Freon 12	0.001	not detected
Vinyl Chloride	0.001	not detected
Freon 11	0.001	not detected
1.1-Dichloroethene	0.001	not detected
Dichloromethane	0.001	not detected
Trichlorotriflouroethane	0.001	not detected
1,1-Dichloroethane	0.001	0.168
c-1,2-Dichloroethene	0.001	0.077
t-1,2-Dichloroethene	0.001	0.115
Chloroform	0.001	not detected
1,1,1-Trichloroethane	0.001	not detected
1.2-Dichloroethane	0.001	not detected
Benzene	0.001	not detected
Carbon Tetrachloride	0.001	0.002
Trichloroethene	0.001	0.045
Toluene	0.001	0.014
Tetrachloroethene	0.001	not detected



EPA Method TO-02: GC/MS F		
Client: CH2M Hill Site: MW-S-0-2-2 Tube #: 1008		Lab #: 10279 Date Sampled: 3-27-91 Date Analyzed: 4-4-91
Compound	MDL	Concentration ug
Freon 12 Vinyl Chloride Freon 11 1,1-Dichloroethene Dichloromethane Trichlorotriflouroethane1-Dichloroethane c-1,2-Dichloroethene t-1,2-Dichloroethene Chloroform 1,1,1-Trichloroethane 1,2-Dichloroethane Benzene	0.001 0.001 0.001 0.001 0.001 0.001	0.135 not detected 0.679 0.15 0.047 6.906 not detected not detected not detected not detected not detected 0.007 not detected 0.005
Carbon Tetrachloride Trichloroethene Toluene Tetrachloroethene	0.001 0.001 0.001 0.001	not detected 0.009 0.020 not detected



EPA Method	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill		Lab #: 10280	
Site: MW-T-0-2-3		Date Sampled: 3-27-9	91
Tube #: 2002		Date Analyzed: 4-4-91	
Compound	MDL	Concentration	
•	ug	ug	
Freon 12	0.001	0.005	
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.005	
1.1-Dichloroethene	0.001	0.005	
Dichloromethane	0.001	0.023	
Trichlorotriflouroethane	0.001	1.446	
1.1-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1.1,1-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	not detected	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	not detected	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Full Scan

Senzene

Toluene

1.1.1-Trichloroethane

1.2-Dichloroethane

Carbon Tetrachloride

Tetrachloroethene

Trichloroethene

Client: CH2M Hill Site: MW-S-0-3-1 Tube #: 1006	te: MW-S-0-3-1 Date Sampled: be #: 1906 Date Analyzed:	
Compound	MDL ug	Concentration ug
Freon 12 Vinyl Chloride Freon 11	0.001 0.001 0.001	0.037 not detected 0.014
1.1-Dichloroethene Dichloromethane Trichlorotriflouroethane	0.001 0.001 0.001	0.021 not detected 8.031
.1-Dichloroethane c-1,2-Dichloroethene	0.001 0.001	not detected not detected
t-1,2-Dichloroethene Chloroform	0.001 0.001	not detected not detected

0.001

0.001

0.001

0.001

0.001

0.001

0.001

not detected

not detected

0.003

0.002

0.021

0.027

0.032



EPA :	Method	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill Site: MW-S-0-3-2 Tube #: 1005		Lab #: Date Sampled: Date Analyzed:	3-28-91 4-4-91
Compound	MDL ug	Concentration ug	
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene	0.001 0.001 0.001 0.001 0.001 0.001 0.001	0.201 not detected 0.047 not detected not detected 23.43 not detected not detected not detected not detected not detected 0.005 not detected not detected 0.018 0.036 0.005	
Toluene Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Full Scan

	CH2M Hill	Lab #:	10302
Site:	MW-S-0-3-3	Date Sampled:	3-28-91
Tube #:	2012	Date Analyzed:	4-4-91

Compound	MDL	Concentration
.	ug	ug
Freon 12	0.001	0.345
Vinyl Chloride	0.001	not detected
Freon 11	0.001	0.041
1.1-Dichloroethene	0.001	0.004
Dichloromethane	0.001	0.009
Trichlorotriflouroethane	0.001	18.54
1,1-Dichloroethane	0.001	not detected
c-1,2-Dichloroethene	0.001	not detected
t-1,2-Dichloroethene	0.001	not detected
Chloroform	0.001	not detected
1.1.1-Trichloroethane	0.001	0.005
1.2-Dichloroethane	0.001	not detected
Benzene	0.001	0.902
Carbon Tetrachloride	0.001	not detected
Trichloroethene	0.001	0.006
Toluene	0.001	0.23
Tetrachloroethene	0.001	not detected



EPA Method TO-02: GC/MS Fo		
Client: CH2M Hill Site: MW-S-0-3-B Tube #: 2014		Lab #: 10303 Date Sampled: 3-28-91 Date Analyzed: 4-4-91
Compound	MDL ug	Concentration ug
Freon 12	0.001	not detected
Vinyl Chloride	0.001	not detected
Freon 11	0.001	not detected
1,1-Dichloroethene	0.001	not detected
Dichloromethane	0.001	0.005
Trichlorotriflouroethane	0.001	not detected
1.1-Dichloroethane	0.001	not detected
c-1,2-Dichloroethene	0.001	not detected
t-1.2-Dichloroethene	0.001	not detected
Chloroform	0.001	not detected
1.1.1-Trichloroethane	0.001	0.004
1.2-Dichloroethane	0.001	not detected
Benzene	0.001	not detected
Carbon Tetrachloride	0.001	not detected
Trichloroethene	0.001	not detected
Toluene	0.001	not detected
Tetrachloroethene	0.001	not detected



EPA Method TO-14: GC/MS Full Scan

Client:	CH2M Hill	Lab #:	10443
Site:	VR-B-0-44-B	Date Sampled:	4-9-91
Can #:	Bag	Date Analyzed:	4-10-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	58	330
1,1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	·1 . 50	8.4	29
Trichlorotriflouroethane	1.50	not detected	not detected
1,1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	10	55
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	4.5	17
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10444

 Site:
 VR-B-0-44-1
 Date Sampled:
 4-9-91

 Can #:
 Bag
 Date Analyzed:
 4-10-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1,1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	not detected	not detected
Trichlorotriflouroethane	1.50	4.5	35
1,1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	not detected	not detected
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene -	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10441
Site: VR-B-0-43-3 Date Sampled: 4-9-91
Can #: Bag Date Analyzed: 4-10-91

Compound	MDL	Concentration	Concentration	
	ppbv	ppbv	ug/m3	
Freon 12	2.30	not detected	not detected	
Vinyl Chloride	0ز . 2	not detected	not detected	
Freon 11	2.50	not detected '	not detected	
1,1-Dichloroethene	2.50	not detected	not detected	
Dichloromethane	•2.50	not detected	not detected	
Trichlorotriflouroethane	2.50	not detected	not detected	
1,1-Dichloroethane	2.50	not detected	not detected	
c-1,2-Dichloroethene	2.50	not detected	not detected	
t-1,2-Dichloroethene	2.30	not detected	not detected	
Chloroform	2.50	not detected	not detected	
1,1,1-Trichloroethane	2.50	not detected	not detected	
1,2-Dichloroethane	2.50	not detected	not detected	
Benzene	2.50	not detected	not detected	
Carbon Tetrachloride	2.50	not detected	not detected	
Trichloroethene	2.50	not detected	not detected	
Toluene	2.50	not detected	not detected	
Tetrachloroethene	2.50	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10442

Site: VR-B-0-43-4 Date Sampled: 4-9-91
Can #: Bag Date Analyzed: 4-10-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	2.30	not detected	not detected	
Vinyl Chloride	0د . 2	not detected	not detected	
Freon 11	2.30	not detected	not detected	
1,1-Dichloroethene	2.50	not detected	not detected	
Dichloromethane	2.50	not detected	not detected	
Trichlorotriflouroethane	2.50	20	150	
1,1-Dichloroethane	2.50	not detected	not detected	
c-1,2-Dichloroethene	2.50	not detected	not detected	
t-1,2-Dichloroethene	2.50	not detected	not detected	
Chloroform	2.50	not detected	not detected	
1,1,1-Trichloroethane	2.50	not detected	not detected	
1,2-Dichloroethane	2.50	not detected	not detected	
Benzene	2.50	not detected	not detected	
Carbon Tetrachloride	2.50	not detected	not detected	
Trichloroethene	2.50	not detected	not detected	
Toluene	2.50	not detected	not detected	
Tetrachloroethene	2.50	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10439
Site: VR-B-0-43-1 Date Sampled: 4-9-91
Can #: Bag Date Analyzed: 4-10-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.38	not detected	not detected
Vinyl Chloride	1.38	not detected	not detected
Freon 11	1.38	not detected	not detected
1,1-Dichloroethene	1.38	not detected	not detected
Dichloromethane	1.88	not detected	not detected
Trichlorotriflouroethane	1.88	not detected	not detected
1,1-Dichloroethane	1.38	not detected	not detected
c-1,2-Dichloroethene	1.38	not detected	not detected
t-1,2-Dichloroethene	1.88	not detected	not detected
Chloroform	1.88	not detected	not detected
1,1,1-Trichloroethane	1.98	not detected	not detected
1,2-Dichloroethane	1.38	not detected	not detected
Benzene	1.88	not detected	not detected
Carbon Tetrachloride	1.88	not detected	not detected
Trichloroethene	1.88	not detected	not detected
Toluene	1.88	not detected	not detected
Tetrachloroethene	1.88	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10440
Site: VR-B-0-43-2 Date Sampled: 4-9-91
Can #: Bag Date Analyzed: 4-10-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	2.14	not detected	not detected	
Vinyl Chloride	2.14	not detected	not detected	
Freon 11	2.14	not detected	not detected	
1,1-Dichloroethene	2,14	not detected	not detected	
Dichloromethane	*2.14	not detected	not detected	
Trichlorotriflouroethane	2.14	not detected	not detected	
1,1-Dichloroethane	2.14	not detected	not detected	
c-1,2-Dichloroethene	2.14	not detected	not detected	
t-1,2-Dichloroethene	2.14	not detected	not detected	
Chloroform	2.14	not detected	not detected	
1,1,1-Trichloroethane	2.14	not detected	not detected	
1,2-Dichloroethane	2.14	not detected	not detected	
Benzene	2.14	not detected	not detected	
Carbon Tetrachloride	2.14	not detected	not detected	
Trichloroethene	2.14	not detected	not detected	
Toluene	2.14	not detected	not detected	
Tetrachloroethene	2.14	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10431
Date Sampled: 4-8-91
Date Analyzed: 4-10-91 Client: CH2M Hill Site: MW-B-0-4-3 Can #: Bag

Can #: Bag		Date Analy	zed: 4-10-91
Compound	MDL ppbv	Concentration ppbv	ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1,1-Dichloroethene	0.75	36	140
Dichloromethane	0.75	3.3	11
Trichlorotriflouroethane	0.75	120	920
1,1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	9.3	37 ·
Chloroform	0.75	not detected	not detected
1,1,1-Trichloroethane	0.75	2.2	12
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	1.2	4.0
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	190	1000 .
Toluene	0.75	2.0	7.4
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10438
Date Sampled: 4-9-91 Client: CH2M Hill Site: VR-B-0-43-B

Can #: Bag	,	•	yzed: 4-10-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	2.9	14
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	210	1200
1,1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	10.75	25	87
Trichlorotriflouroethane	0.75	not detected	not detected
1,1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	C.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1,1,1-Trichloroethane	0.75	19	100
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	2.1	6.6
Carbon Tetrachloride	0.75	2.5	16
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	57	220
Tetrachloroethene	0.7 5	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-4-1 Can #: Bag Lab #: 10429
Date Sampled: 4-8-91
Date Analyzed: 4-10-91

Can #: Bag		Date Analyzed: 4-10-91	
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	48	190
Dichloromethane	0.75	4.9	17
[richlorotriflouroethane	0.75	280	2100
l.l-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	27	110
Chloroform	0.75	not detected	not detected
l.l.l-Trichloroethane	0.75	1.7	9.3
1.2-Dichloroethane	0.75	not detected	not detected
Senzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	510	2700
Toluene	0.75	1.4	5.3
Tetrachloroethene	0.75	1.7	12



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Site: MW-B-0-4-2

Can +: Bag

Date Sampled: 4-8-91

Date Analyzed: 4-10-91

Can #: Bag		Date Analy	/Zed: 4-10-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	11	56
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1,1-Dichloroethene	1.50	97	390
Dichloromethane	1.50	3.6	13
Trichlorotriflouroethane	1.50	320	2400
l.l-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1.2-Dichloroethene	1.50	29	120
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	7.0	38
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	1.8	5.7
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	500	2700
Toluene	1.50	3.2	12
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #: .10427

 Site:
 MW-B-0-5-4
 Date Sampled: 4-8-91

 Can #:
 Bag
 Date Analyzed: 4-10-91

Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
l.1-Dichloroethene	0.75	9.4	37
Dichloromethane	0.75	5.3	18
Trichlorotriflouroethane	0.75	92	700
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	4.5	18
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Senzene	0.75	0.93	3.0
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	37	200
Toluene	0.75	1.5	5.7
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-4-B

Lab #: 10428
Date Sampled: 4-8-91
Date Analyzed: 4-10-91 Can #: Bag

· · · · · · · · · · · · · · · · · · ·		••••••••••••		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	not detected	not detected	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	not detected	not detected	
1,1-Dichloroethene	0.75	not detected	not detected	
Dichloromethane	0.75	5.2	18	
Trichlorotriflouroethane	0.75	not detected	not detected	
1.1-Dichloroethane	0.75	not detected	not detected	
c-1,2-Dichloroethene	0.75	not detected	not detected	
t-1.2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	not detected	not detected	
1,2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	not detected	not detected	
Trichloroethene	0.75	not detected	not detected	
Toluene	0.75	not detected	not detected	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10425

 Site:
 MW-B-0-5-2
 Date Sampled:
 4-8-91

 Can #:
 Bag
 Date Analyzed:
 4-10-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	11	44
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	160	1300
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	11	45
Chloroform	0	not detected	not detected
1.1.1-Trichloroethane	(not detected	not detected
1.2-Dichloroethane		not detected	not detected
Benzene		not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	86	460
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10426
Date Sampled: 4-8-91
Date Analyzed: 4-10-91 Client: CH2M Hill Site: MW-B-0-5-3

Can #: Bag

Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
l.l-Dichloroethene	0.75	18	73
Dichloromethane	0.75	3.2	11
Trichlorotriflouroethane	0.75	280	2100
l,l-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	15	59
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	110	590
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10423

 Site:
 MW-B-0-5-B
 Date Sampled:
 4-8-91

 Can #:
 Bag
 Date Analyzed:
 4-10-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	not detected	not detected
1,1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
l, l. 1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected





EPA Method TO-14: GC/MS Full Scan

Lab #: 10424
Date Sampled: 4-8-91
Date Analyzed: 4-10-91 Client: CH2M Hill Site: MW-B-0-5-1 Can #: Bag

Jen. 7. Jeg			
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1.1-Dichloroethene	1.50	12	46
Dichloromethane	1.50	12	42
Trichlorotriflouroethane	1.50	91	690
1.1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	4.8	19
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	18	97
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	39	210
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



METHOD BLANK REPORT

QC Lot:	4-10-91 Me	ethod: EPA TO-14 -	GC/MS Full Scan
• • • • • •	Compound	MDL ppbv	Blank (ppbv
	Vinyl Chloride	0.50	not detec
	Acetonitrile	0.50	not detec
	1,1-Dichloroethene	0.50	not detec
	Dichloromethane	0.50	not detec
	1,1-Dichloroethane	0.50	not detec
	Chloroform	0.50	not detec
	1,1.1-Trichloroetha	ane 0.50	not detec
	1,2-Dichloroethane	0.50	not detec
	Benzene	0.50	not detec
	Carbon Tetrachlorio	de 0.50	not detec
	Trichloroethene	0.50	not detec
	Toluene	0.50	not detec
	1,2-Dibromoethane	0.50	not detec
	Tetrachloroethene	0.50	not detec
	Chlorobenzene	0.50	not detec
	Xylenes	0.50	not detec
	Dichlorobenzenes	0.50	not detec
	Benzyl Chloride	0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10387 Duplcte: 10387 D

QC Lot: 4-10-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	ppbv	RPD	•	
Vinyl Chloride	not detec	not detec		40	
Acetonitrile	not detec	not detec		40	
1.1-Dichloroethene	not detec	not detec		40	
Dichloromethane	1.6	2.3	35	40	
l.1-Dichloroethane	not detec	not detec		40	
Chloroform	not detec	not detec		40	
l,l,l-Trichloroethane	3.1	3.3	6	40	
l.2-Dichloroethane	not detec	not detec		40	
Benzene	2.2	2.3	4	40	
Carbon Tetrachloride	not detec	not detec		40	
[richloroethene	not detec	not detec		40	
Coluene	5.3	5.6	5	40	
1,2-Dibromoethane	not detec	not detec		40	
Tetrachloroethene	0.48	0.45	8	40	
Chlorobenzene	not detec	not detec		40	
(ylenes	4.2	4.5	8		
Dichlorobenzenes	not detec	not detec		40	
Benzyl Chloride	not detec	not detec		40	

ANALYTICAL RESULTS April 10, 1991



EPA Met	:hod TO	-02:	GC/MS	Full	Scan
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Client: CH2M Hill		Lab #:	10405
Site: MW-BT-0-7-2 (1st)		Date Sampled:	4-6-91
Tube #: 1009		Date Analyzed:	
			• • • • • • • • • • • • • • • •
Compound	MDL	Concentration	
	ug	ug	
Freon 12	0.001	1.147	
Vinyl Chloride	0.001	4.979	
Freon 11	0.001	0.594	
1.1-Dichloroethene	0.001	32.19	
Dichloromethane	0.001	not detected	
Trichlorotriflouroethane	0.001	134.7	
1,1-Dichloroethane	0.001	5.979	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	0.620	
Chloroform	0.001	0.310	
1,1,1-Trichloroethane	0.001	0.985	
1.2-Dichloroethane	0.001	1.664	
Benzene	0.001	0.145	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	7.837	
Toluene	0.001	0.003	
Tetrachloroethene	0.001	0.052	





EPA Method TO-02: GC/MS Full Scan

Client: CH2M Hill Site: MW-BT-0-7-2 (2nd)		Lab #: Date Sampled:	4-6-91
Tube #: 1000		Date Analyzed:	4-9-91
Compound	MDL	Concentration	
·	ug	ug	
Freon 12	0.001	0.010	
	0.001	not detected	
•	0.001	0.009	
l.l-Dichloroethene	0.001	0.041	
Dichloromethane	0.001	0.024	
Trichlorotriflouroethane	0.001	0.275	
l,l-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l,l,l-Trichloroethane	0.001	0.004	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.031	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.040	
Toluene	0.001	0.022	
Tetrachloroethene	0.001	0.003	



Carbon Tetrachloride

Trichloroethene

Tetrachloroethene

Toluene

Client: CH2M Hill Site: MW-BT-0-7-1 (lst) Tube #: 2021		Lab #: 10403 Date Sampled: 4-6-91 Date Analyzed: 4-9-91
Compound	MDL ug	Concentration ug
Freon 12 Vinyl Chloride	0.001 0.001	0.032 2.604
Freon 11 1,1-Dichloroethene	0.001 0.001	0.320 27.172
Dichloromethane Trichlorotriflouroethane	0.001 0.001	not detected 3.704
1.1-Dichloroethane c-1.2-Dichloroethene	0.001 0.001	4.072 0.004
t-1,2-Dichloroethene Chloroform	0.001 0.001	0.430 0.035
1.1.1-Trichloroethane 1.2-Dichloroethane	0.001 0.001	0.489 0.127
Senzene	0.001	0.095

not detected

not detected

6.123

0.011

0.001

0.001

0.001

0.001



Client: CH2M Hill Site: MW-BT-0-7-1 (2nd)		Lab #: 10404 Date Sampled: 4-6-91
Tube #: 2029		Date Analyzed: 4-9-91
Compound	MDL	Concentration
	ug	u g
Freon 12	0.001	not detected
Vinyl Chloride	0.001	not detected
Freon 11	0.001	not detected
l.l-Dichloroethene	0.001	0.002
Dichloromethane	0.001	0.013
Trichlorotriflouroethane	0.001	not detected
l,l-Dichloroethane	0.001	not detected
:-1,2-Dichloroethene	0.001	not detected
t-1,2-Dichloroethene	0.001	not detected
Chloroform	0.001	not detected
l.l.l-Trichloroethane	0.001	not detected
	0.001	not detected
Benzene	0.001	0.002
Carbon Tetrachloride	0.001	not detected
Trichloroethene	0.001	0.015

0.001

0.001

Toluene

Tetrachloroethene

0.003

not detected



EPA Method TO-02: GC/MS Fu			
Client: CH2M Hill Site: MW-T-0-6-2 (2nd) Tube #: 1005		Lab #: 10400 Date Sampled: 4-6-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-9-	91
Compound	MDL ug	Concentration ug	• • • ·
Freon 12	0.001	0.166	• • •
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.014	
l,l-Dichloroethene	0.001	0.016	
ichloromethane	0.001	0.005	
:ichlorotriflouroethane	0.001	0.031	
l,l-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	0.007	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	not detected	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.016	
Toluene	0.001	0.012	

not detected

0.001

Tetrachloroethene



EPA Method	TO-02:	GC/MS	Full	Scan

Client: CH2M Hill Site: MW-T-0-6-3 (2nd) Tube #: 2015	••••••		
Compound	MDL ug	Concentration ug	
Freon 12	0.001	0.061	• • • • • • • • •
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	not detected	
l.l-Dichloroethene	0.001	0.006	
Dichloromethane	0.001	0.010	
Trichlorotriflouroethane	0.001	not detected	
l,1-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	0.007	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.001	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.011	
Toluene	0.001	0.017	
Tetrachloroethene	0.001	not detected	



EPA	Method	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill Site: MW-T-0-6-B Tube #: 2020		Lab #: Date Sampled: Date Analyzed:	
Compound	MDL ug	Concentration ug	
Freon 12	0.001	0.042	
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.005	
1.1-Dichloroethene	0.001	0.008	
Dichloromethane	0.001	0.034	
Trichlorotriflouroethane	0.001	not detected	
1,1-Dichleroethane	0.001	not detected	
c-1.2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1,1.1-Trichloroethane	0.001	not detected	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.006	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	0.014	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Full Scan

1,1,1-Trichloroethane

Carbon Tetrachloride

Trichloroethene

Tetrachloroethene

1.2-Dichloroethane

Benzene

Toluene

Client: CH2M Hill Site: MW-T-0-6-1 (2nd) Tube #: 2003		Date Analyzed:	10399 B 4-6-91 4-9-91
Compound	MDL	Concentration	••••••
	ug	ug,	
Freon 12	0.001	0.252	
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.009	
1.1-Dichloroethene	0.001	0.037	
Dichloromethane	0.001	0.012	
Trichlorotriflouroethane	0.001	0.467	
1.1-Dichloroethane	0.001	not detected	
c-1.2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	

0.048

0.005

0.007 0.038

0.074

0.022

not detected

0.001

0.001

0.001

0.001

0.001

0.001

0.001



EPA Method TO-02: GC/MS Fu		***************************************	
Client: CH2M Hill Site: MW-T-0-9-2 (2nd) Tube #: 2013		Lab #: 10360 Date Sampled: 4-6-91 Date Analyzed: 4-9-91	••
Compound	MDL	Concentration	
	ug	ug .	
Freon 12	0.001	0.075	• • •
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	not detected	•
1,1-Dichloroethene	0.001	0.028	
Dichloromethane	0.001	0.010	
Trichlorotriflourcethane	0.001	0.045	
1,1-Dichloroethane	0.001	not detected	
c-l,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1,1,1-Trichloroethane	0.001	not detected	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	not detected	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.044	
Toluene	0.001	0.013	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Fu		
Client: CH2M Hill Site: MW-T-0-9-3 (2nd) Tube #: 2008		Lab #: 10362 Date Sampled: 4-6-91 Date Analyzed: 4-9-91
Compound	MDL	Concentration
	ug	ug
Freon 12	0.001	0.076
Vinyl Chloride	0.001	not detected
Freon 11	0.001	C.008 ·
1,1-Dichloroethene	0.001	0.091
Dichloromethane	0.001	0.013
Trichlorotriflouroethane	0.001	0.132
1.1-Dichloroethane	0.001	not detected
c-1,2-Dichloroethene	0.001	not detected
t-1.2-Dichloroethene	0.001	not detected
Chloroform	0.001	not detected
1.1.1-Trichloroethane	0.001	0.049
1.2-Dichloroethane	0.001	not detected
Benzene	0.001	0.109
Carbon Tetrachloride	0.001	not detected
Trichloroethene	0.001	0.028
Toluene	0.001	0.181
Tetrachloroethene	0.001	not detected



EPA Method	TO-02:	GC/MS	Full	Scan
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61 :	auau :::13	• • •	10040
Client:	CH2M Hill	Lab #:	10340
Site:	MW-T-0-8-3	Date Sampled:	4-3-91
Tube #:	2016	Date Analyzed:	4-9-91
		•••••••••••	

	Date Analyzed: 4-9-91
MDL	Concentration
ug	ug
0.001	0.245
0.001	1.81
0.001	1.32
0.001	41.3
0.001	not detected
0.001	56.7
0.001	0.534
0.001	0.002
0.001	0.014
0.001	not detected
0.001	0.991
0.001	not detected
0.001	0.025
0.001	0.003
0.001	1.70
0.001	0.050
0.001	0.235
	0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001



Client: CH2M Hill		Lab #:	
Site: MW-T-0-9-B		Date Sampled:	
Tube #: 2007		Date Analyzed:	4-9-91
Compound	MDL	Concentration	
	п ã	ug	
Freon 12	0.001	0.164	•••••
/inyl Chloride	0.001	not detected	
Freon 11	0.001	0.017	
.,l-Dichloroethene	0.001	0.007	
oichloromethane '	0.001	0.037	
[richlorotriflouroethane	0.001	0.036	
.l-Dichloroethane	0.001	not detected	
:-1,2-Dichloroethene	0.001	not detected	
:-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1,1,1-Trichloroethane	0.001	0.007	
L.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.012	
arbon Tetrachloride	0.001	not detected	
[richloroethene	0.001	not detected	
Toluene	0.001	0.112	
Tetrachloroethene	0.001	not detected	



EPA Meth	od TO-02:	GC/MS	Full	Scan
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Client:	CH2M Hill	. Lab #:	10338
Site:	MW-T-0-8-1	Date Sampled:	4-3-91
Tube #:	2000	Date Analyzed:	4-9-91

105 6 %. 2000		Date Miatyzed.	4-3-31
Compound	MDL	Concentration	
	ug	ug	
Freon 12	0.001	0.008	
Vinyl Chloride	0.001	1.16	•
Freon 11	0.001	1.06	•
l,1-Dichloroethene	0.001	23.2	
lichloromethane	0.001	not detected	
richlorotriflouroethane	0.001	38.0	
l,1-Dichloroethane	0.001	0.252	
c-1,2-Dichloroethene	0.001	0.002	
t-1,2-Dichloroethene	0.001	0.008	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	0.630	
1,2-Dichloroethane	0.001	not detected	
Senzene	0.001	0.018	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	1.18	
Toluene	0.001	0.081	
Tetrachloroethene	0.001	0.167	



EPA Method TO-02:	GC/MS Full	Scan
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Benzene Carbon Tetrachloride

Trichloroethene

Tetrachloroethene

Client: CH2M Hill Site: MW-S-0-8-2 Tube #: 1001		Lab #: Date Sampled: Date Analyzed:	
Compound	MDL ug	Concentration ug	••••••
Freon 12	0.001	1.52	
Vinyl Chloride	0.001	2.07	
Freon 11	0.001	1.97	•
1.1-Dichloroethene	0.001	33.9	
Dichloromethane	0.001	not detected	
Trichlorotriflouroethane	0.001	45.7	
1.1-Dichloroethane	0.001	0.786	
c-l.2-Dichloroethene	0.001	0.002	
t-1.2-Dichloroethene	0.001	0.017	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	1.46	
1.2-Dichloroethane	0.001	not detected	

0.015

0.015

2.22

0.24

0.197

0.001

0.001

0.001

0.001

0.001



Client: CH2M Hill		Lab #: 10324	
Site: MW-S-0-7-3		Date Sampled: 4-2-9	
Tube #: 1002		Date Analyzed: 4-9-9	
Compound	MDL	Concentration	
	пã	ug	
reon 12	0.001	not detected	
inyl Chloride	0.001	3.75	
Freon 11	0.001	0.467	
.l-Dichloroethene	0.001	11.39	
oichloromethane	0.001	not detected	
[richlorotriflouroethane	0.001	31.18	
.1-Dichloroethane	0.001	4.28	
:-1,2-Dichloroethene	0.001	not detected	
:-1,2-Dichloroethene	0.001	0.603	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	0.878	
L.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.124	
Carbon Tetrachloride	0.001	not detected	
[richloroethene	0.001	8.70	
Toluene	0.001	0.044	
Tetrachloroethene	0.001	0.400	



EPA Method TO-02: GC/MS Full Scan

Tetrachloroethene

Client: CH2M Hill Site: MW-T-0-7-4		Lab #: 10325 Date Sampled: 4-2-91
Tube #: 2006		Date Analyzed: 4-9-91
Compound	MDL	Concentration
	п a	ug
Freon 12	0.001	0.896
Vinyl Chloride	0.001	2.36
Freon 11	0.001	0.353
1,1-Dichloroethene	0.001	18.37
Dichloromethane	0.001	not detected
Trichlorotriflouroethane	0.001	31.16
1,1-Dichloroethane	0.001	2.30
c-1,2-Dichloroethene	0.001	0.003
t-1,2-Dichloroethene	0.001	0.277
Chloroform	0.001	not detected
1.1.1-Trichloroethane	0.001	0.321
1,2-Dichloroethane	0.001	not detected
Benzene	0.001	0.064
Carbon Tetrachloride	0.001	not detected
Trichloroethene	0.001	5.26
Toluene	0.001	0.18

0.258

0.001



Client: CH2M Hill		Lab #:	10322
Site: MW-T-0-7-1		Date Sampled:	
Tube #: 2009		Date Analyzed:	
			• • • • • • • • • • • • • • • • • • • •
Compound	MDL	Concentration	
	ug	ug	
reon 12	0.001	not detected	• • • • • • • • •
inyl Chloride	0.001	3.84	
reon 11	0.001	0.379	
,1-Dichloroethene	0.001	20.03	
ichloromethane	0.001	not detected	
richlorotriflouroethane	0.001	25.01	
.,l-Dichloroethane	0.001	3.58	
:-1,2-Dichloroethene	0.001	0.008	
:-1,2-Dichloroethene	0.001	0.331	
Chloroform	0.001	not detected	
.,l,l-Trichloroethane	0.001	0.715	
2-Dichloroethane	0.001	0.712	
denzene	0.001	0.136	
Carbon Tetrachloride	0.001	not detected	
richloroethene	0.001	7.67	
Coluene	0.001	0.049	
[etrachloroethene	0.001	0.398	



EPA Method TO-02: GC/MS Fu	ll Scan		
Client: CH2M Hill Site: MW-T-0-7-2		Lab #: 10323 Date Sampled: 4-2-91	
Tube #: 2017		Date Analyzed: 4-9-91	
Compound	MDL	Concentration	
•	ug	ug	
Freon 12	0.001	not detected	
Vinyl Chloride	0.001	6.50	
Freon 11	0.001	0.258	
1.1-Dichloroethene	0.001	28.88	
	0.001	not detected	
Trichlorotriflouroethane	0.001	24.54	
1.1-Dichloroethane	0.001	4.17	
c-1.2-Dichloroethene	0.631	0.011	
t-1.2-Dichloroethene	0.001	0.574	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	0.395	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.074	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	4.46	
Toluene	0.001	0.003	
Tetrachloroethene	0.001	0.028	

ANALYTICAL RESULTS April 9, 1991



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-6-2 Can #: Bag Lab #: 10391
Date Sampled: 4-6-91
Date Analyzed: 4-8-91

Can #. Dag		Date Analyzed. 4-0-71		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	1.50	7.0	35	
Vinyl Chloride	1.50	not detected	not detected	
Freon 11	1.50	not detected	not detected	
1,1-Dichloroethene	1.50	not detected	not detected	
Dichloromethane	1.50	21	73	
Trichlorotriflouroethane	1.50	690	5300	
1,1-Dichloroethane	1.50	not detected	not detected	
c-l,2-Dichloroethene	1.50	not detected	not detected	
t-1,2-Dichloroethene	1.50	1.9	7.6	
Chloroform	1.50	not detected	not detected	
1.1.1-Trichloroethane	1.50	11	59	
1.2-Dichloroethane	1.50	not detected	not detected	
Benzene	1.50	not detected	not detected	
Carbon Tetrachloride	1.50	not detected	not detected	
Trichloroethene	1.50	61	330	
Toluene	1.50	37	140	
Tetrachloroethene	1.50	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10389
Date Sampled: 4-6-91
Date Analyzed: 4-8-91 Client: CH2M Hill Site: MW-B-0-6-B Can #: Bag

Can y. Dag		Date Rully2ed. 4-0-71		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	0.75	27	130	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	not detected	not detected	
1.1-Dichloroethene	0.75	not detected	not detected	
Dichloromethane	0.75	7.2	25	
Trichlorotriflouroethane	0.75	not detected	not detected	
1.1-Dichloroethane	0.75	not detected	not detected	
c-1,2-Dichloroethene	0.75	not detected	not detected	
t-1.2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1.1.1-Trichloroethane	0.75	not detected	not detected	
1.2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	not detected	not detected	
Trichloroethene	0.75	not detected	not detected	
Toluene	0.75	3.0	12	
Tetrachloroethene	0.75	not detented	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-6-1 Can #: Bag Lab #: 10390

Date Sampled: 4-6-91 Date Analyzed: 4-8-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	16	77
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1.1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	16	56
Trichlorotriflouroethane	1.50	740	5700
1.1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
r-1,2-Dichloroethene	1.50	1.9	7.6
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	not detected	not detected
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	44	240
Toluene	1.50	4.3	16
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10375

 Site:
 VR-B-0-31-3
 Date Sampled:
 4-5-91

 Can #:
 Bag
 Date Analyzed:
 4-8-91

Compound	MDL	Concentration	Concentration
,	ppbv	ppbv	ug/m3
Freon 12	3.75	not detected	not detec
Vinyl Chloride	3.75	not detected	not detec
Freon 11	3.75	not detected	not detec
1.1-Dichloroethene	3.75	120	460
Dichloromethane	3.75	21	74
Trichlorotriflouroethane	3.75	140	1100
1.1-Dichloroethane	3.75	not detected	not detec
c-1,2-Dichloroethene	3.75	not detected	not detec
t-1,2-Dichloroethene	3.75	not detected	not detec
Chloroform	3.75	not detected	not detec
1.1.1-Trichloroethane	3.75	58	320
1.2-Dichloroethane	3.75	not detected	not detec
Benzene	3.75	not detected	not detec
Carbon Tetrachloride	3.75	not detected	not detec
Trichloroethene	3.75	15	81
Toluene	3.75	not detected	not detec
Tetrachloroethene	3.75	not detected	not detec



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10376

 Site:
 VR-B-0-31-4
 Date Sampled:
 4-5-91

 Can #:
 Bag
 Date Analyzed:
 4-8-91

	5400 MM2/200. 4 0 /2		
MDL ppbv	Concentration ppbv	Concentration ug/m3	
3.75	not detected	not detected	
3.75	not detected	not detected	
3.75	35	20 0	
3.75	340	1400	
3.75	not detected	not detected	
3.75	170	1300	
3.75	not detected	not detected	
3.75	not detected	not detected	
3.75	not detected	not detected	
3.75	not detected	not detected	
3.75	150	790	
3.75	not detected	not detected	
3.75	not detected	not detected	
3.75	not detected	not detected	
3.75	33	180	
3.75	not detected	not detected	
3.75	not detected	not detected	
	3.75 3.75 3.75 3.75 3.75 3.75 3.75 3.75	MDL ppbv ppbv 3.75 not detected 3.75 not detected 3.75 35 3.75 340 3.75 not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10373
Site: VR-B-0-31-1 Date Sampled: 4-5-91
Can #: Bag Date Analyzed: 4-8-91

Can #: bag		Date Allary	/2eu. 4-8-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	32	180
1,1-Dichloroethene	3.75	280	1100
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	260	20 00
1.1-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1,1,1-Trichloroethane	3.75	140	760
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	31	170
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10374
Site: VR-B-0-31-2 Date Sampled: 4-5-91
Can #: Bag Date Analyzed: 4-8-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	180	720
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	130	1000
1,1-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	69	370
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	16	86
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-8-B Can #: 106 Lab #: 10346
Date Sampled: 4-3-91
Date Analyzed: 4-8-91

Uan #: 106		•	yzed: 4-8-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	4.3	15
Trichlorotriflouroethane	0.75	not detected	not detected
l.l-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	nct detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10372

 Site:
 VR-B-0-31-B
 Date Sampled:
 4-5-91

 Can #:
 Bag
 Date Analyzed:
 4-8-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	260	1300
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1,1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	6.5	22
Trichlorotriflouroethane	0.75	not detected	not detected
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	2.6	9.6
Tetrachloroethene	0.75	not detected	not detected



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10388 Duplcte: 10388 D

QC Lot: 4-8-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec		40
1,1-Dichloroethene	not detec	not detec		40
Dichloromethane	4.3	4.0	7	40
Trichlorotrifluoroethane	not detec	not detec		40
1,1-Dichloroethane	not detec	not detec		40
c-1.2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	2.5	2.1	17	_
1,2-Dichloroethane	not detec	not detec		40
Benzene	1.8	1.4	24	
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	not detec	not detec		40
Toluene	4.9	4.3	13	=
Tetrachloroethane	0.40	0.27	39	40



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10388 Duplcte: 10388 D QC Lot: 4-8-91

C Lot: 4-8-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec		40
1.1-Dichloroethene	not detec	not detec		40
Dichloromethane	4.3	4.0	7	40
Trichlorotrifluoroethane	not detec	not detec		40
1.1-Dichloroethane	not detec	not detec		40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1.1.1-Trichloroethane	2.5	2.1	17	40
1.2-Dichloroethane	not detec	not detec		40
Benzene	1.8	1.4	24	40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	not detec	not detec		40
Toluene	4.9	4.3	13	40
Tetrachloroethane	0.40	0.27	39	40



METHOD BLANK REPORT

QC Lot: 4	4-8-91	Method:	EPA TO-14	- GC/MS Ful	l Scan
(Compound		MDL ppbv		lank pbv)
I	Freon 12		0.50	not	detec
1	Vinyl Chloride		0.50	not	detec
F	Freon 11		0.50	not	detec
1	l,l-Dichloroether	16	0.50	not	detec
I	Dichloromethane		0.50	not	detec
7	Trichlorotrifluor	oethane	0.50	not	detec
1	l.l-Dichloroethan	le	0.50	not	detec
c	:-1.2-Dichloroeth	ene	0.50	not	detec
t	t-1,2-Dichloroeth	ene	0.50	not	detec
(Chloroform		0.50	not	detec
1	l,l,l-Trichloroet	hane	0.50	not	detec
1	l,2-Dichloroethar	10	0.50	not	detec
I	Benzene		0.50	not	detec
(Carbon Tetrachlor	ride	0.50	not	detec
1	Trichloroethene		0.50	not	detec
1	Toluene		0.50	not	detec
1	Tetrachloroethane	}	0.50	not	detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10388 Duplcte: 10388 D

QC Lot: 4-8-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec		40
1,1-Dichloroethene	not detec	not detec		40
Dichloromethane	4.3	4.0	7	40
Trichlorotrifluoroethane	not detec	not detec		40
l.l-Dichloroethane	not detec	not detec		40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
l,l,l-Trichloroethane	2.5	2.1	17	40
1,2-Dichloroethane	not detec	not detec		40
Benzene	1.8	1.4	24	40
Carbon Terrachloride	not detec	not detec	_	40
Trichloroethene	not detec	not detec		40
Toluene	4.9	4.3	13	40
Tetrachloroethane	0,40	0.27	39	



METHOD BLANK REPORT

QC Lot:	4-8-91 Method:	EPA TO-14	- GC/MS Full Scan
•••••	Compound	MDL ppbv	Blank (ppbv)
	Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoroethane 1.1-Dichloroethene c-1.2-Dichloroethene t-1.2-Dichloroethene Chloroform 1.1.1-Trichloroethane 1.2-Dichloroethane Benzene Carbon Tetrachloride Trichloroethene Toluene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec
	Tetrachloroethane	0.50	not detec



METHOD BLANK REPORT

QC Lot:	4-8-91 Me	thod: EPA TO-14	- GC/MS Full S	Scan
	Compound	MDL ppbv	Blar (ppb	
•••••	Freon 12	0.50	not de	tec
	Vinyl Chloride	0.50	not de	etec
	Freon 11	0.50	not de	tec
	1,1-Dichloroethene	0.50	not de	tec
	Dichloromethane	0.50	not de	tec
	Trichlorotrifluoroe	thane 0.50	not de	tec
	1.1-Dichloroethane	0.50	not de	tec
	c-1,2-Dichloroether	e 0.50	not de	etec
	t-1,2-Dichloroether	e 0.50	not de	etec
	Chloroform	0.50	not de	tec
	1,1,1-Trichloroetha	ne 0.50	not de	tec
	1,2-Dichloroethane	0.50	not de	tec
	Benzene	0.50	not de	tec
	Carbon Tetrachlorid	le 0.50	not de	tec
	Trichloroethene	0.50	not de	tec
	Toluene	0.50	not de	etec
	Tetrachloroethane	0.50	not de	etec

ANALYTICAL RESULTS April 8, 1991



EPA Method TO-14: GC/MS Full Scan

Lab #: 10370
Date Sampled: 4-4-91
Date Analyzed: 4-6-91 Client: CH2M Hill Site: MW-B-0-9-4 Can #: Bag

Can #: Bag		Date Anal	yzed: 4-6-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	2.00	not detected	not detected
Vinyl Chloride	2.00	not detected	not detected
Freon 11	2.00	120	660 ·
1.1-Dichloroethene	2.00	11000	4500 0
Dichloromethane	2.00	not detected	not detected
richlorotriflouroethane	2.00	7100	54000
1.1-Dichloroethane	2.00	not detected	not detected
c-1,2-Dichloroethene	2.00	not detected	not detected
t-1,2-Dichloroethene	2.00	not detected	not detected
Chloroform	2.00	not detected	not detected
1,1,1-Trichloroethane	2.00	31	170
1,2-Dichloroethane	2.00	not detected	not detected
Benzene	2.00	not detected	not detected
Carbon Tetrachloride	2.00	not detected	not detected
Trichloroethene	2.00	53	290
Toluene	2.00	not detected	not detected
Tetrachloroethene	2.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10368

 Site:
 MW-B-0-9-2
 Date Sampled:
 4-4-91

 Can #:
 Bag
 Date Analyzed:
 4-6-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	2.00	not detected	not detected
Vinyl Chloride	2.00	not detected	not detected
Freon 11	2.00	80	450
1,1-Dichloroethene	2.00	9700	38000
Dichloromethane	2.00	33	120
Trichlorotriflouroethane	2.00	6000	46000
1.1-Dichloroethane	2.00	not detected	not detected
c-1.2-Dichloroethene	2.00	not detected	not detected
t-1.2-Dichloroethene	2.00	not detected	not detected
Chloroform	2.00	not detected	not detected
1.1.1-Trichloroethane	2.00	27	150
1.2-Dichloroethane	2.00	not detected	not detected
Benzene	2.00	not detected	not detected
Carbon Tetrachloride	2.00	not detected	not detected
Trichloroethene	2.00	45	240
Toluene	2.00	2.2	8.3
Tetrachloroethene	2.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10369
Site: MW-B-0-9-3 Date Sampled: 4-4-91
Can #: Bag Date Analyzed: 4-6-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	2.00	170	830
Vinyl Chloride	2.00	not detected	not detected
Freen 11	2.00	83	470
1,1-Dichloroethene	2.00	15000	58000
Dichloromethane	2.00	not detected	not detected
Trichlorotriflouroethane	2.00	8200	63000
1.1-Dichloroethane	2.00	not detected	not detected
c-1,2-Dichloroethene	2.00	not detected	not detected
t-1,2-Dichloroethene	2.00	not detected	not detected
Chloroform	2.00	not detected	not detected
1.1.1-Trichloroethane	2.00	29	160
1.2-Dichloroethane	2.00	not detected	not detected
Benzene	2.00	not detected	not detected
Carbon Tetrachloride	2.00	not detected	not detected
Trichloroethene	2.00	51	280 ·
Toluene	2.00	not detected	not detected
Tetrachloroethene	2.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10367

 Site:
 MW-B-0-9-1
 Date Sampled:
 4-4-91

 Can #:
 Bag
 Date Analyzed:
 4-6-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	140	810
1,1-Dichloroethene	3.00	11000	45000
Dichloromethane	3.00	21	74
[richlorotriflouroethane	3.00	9200	71000
1.1-Dichloroethane	3.00	not detected	not detected
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1,1,1-Trichloroethane	3.00	46	250
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	52	280
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-9-1 Can #: Bag Lab #: 10367 D
Date Sampled: 4-4-91
Date Analyzed: 4-6-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	180	· 100 0
1.1-Dichloroethene	3.00	15000	61000
Dichloromethane	3.00	29	100
Trichlorotriflouroethane	3.00	12000	93000
1,1-Dichloroethane	3.00	not detected	not detected
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1,1,1-Trichloroethane	3.00	42	230
1.2-Dichloroethane	- 3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	49	260
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	not detected	not detected



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10367 Duplcte: 10367 D QC Lot: 4-6-91

C Lot: 4-6-91 Method: EPA TO-14 - GC/MS Full Scan

	Sample	Duplicate		QC	
Compound	bbpa	ppbv	RPD	Limits	
Freon 12	not detec	not detec		40	
Vinyl Chloride	not detec	not detec		40	
Freon 11	140	180	25	40	
1,1-Dichloroethene	11000	15000	31	40	
Dichloromethane	21	29	32	40	
Trichlorotrifluoroethane	9200	12000	26	40	
1,1-Dichloroethane	not detec	not detec		40	
c-1,2-Dichloroethene	not detec	not detec		40	
t-1,2-Dichloroethene	not detec	not detec		40	
Chloroform	not detec	not detec		40	
1,1,1-Trichloroethane	46	42	9	40	
1,2-Dichloroethane	not detec	not detec		40	
Benzene	not detec	not detec		40	
Carbon Tetrachloride	not detec	not detec		40	
Trichloroethene	52	49	6	40	
Toluene	not detec	not detec		40	
Tetrachloroethane	not detec	not detec		40	



METHOD BLANK REPORT

QC Lot:	4-6-91 Meth	nod: EPA TO-14 -	GC/MS Full Scan
,	Compound	MDL ppbv	Blank (ppbv)
	Freon 12	0.50	not detec
	Vinyl Chloride	0.50	not detec
_	Freon 11	0.50	not detec
	1.1-Dichloroethene	0.50	not detec
	Dichloromethane	0.50	not detec
	[richlorotrifluoroeth	ane 0.50	not detec
	l.1-Dichloroethane	0.50	not detec
	:-1,2-Dichloroethene		not detec
	:-1,2-Dichloroethene	0.50	not detec
	Chloroform	0.50	not detec
1	l,1,1-Trichloroethane	0.50	not detec
1	.,2-Dichloroethane	0.50	not detec
E	Benzene	0.50	not detec
C	Carbon Tetrachloride	0.50	not detec
1	Trichloroethene	0.50	not detec
1	Coluene	0.50	not detec
I	etrachloroethane	0.50	not detec

ANALYTICAL RESULTS April 6, 1991



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10371

 Site:
 MW-B-0-9-B
 Date Sampled:
 4-4-91

 Can +:
 Bag
 Date Analyzed:
 4-5-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freen 11	0.75	5.1	29
1,1-Dichloroethene	0.75	2.8	11
ichloromethane	0.75	4.8	17
richlorotriflouroethane	0.75	4.7	26
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichlorcethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	4.8	26
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	1.2	3.8
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	14	51
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10344 D

 Site:
 MW-B-0-8-3
 Date Sampled:
 4-3-91

 Can #:
 Bag
 Date Analyzed:
 4-5-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	150	870
1.1-Dichloroethene	3.75	25000	100000
Dichloromethane	3.75	47	160
Trichlorotriflouroethane	3.75	17000	130000
1,1-Dichloroethane	3.75	96	390
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
l.l.l-Trichloroethane	3.75	220	1200
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	740	4000
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	23	150



EPA Method TO-14: GC/MS Full Scan

Client:	CH2M Hill	Lab #:	10345
Site:	MW-B-0-8-B	Date Sampled:	4-3-91
Can #:	Bag	Date Analyzed:	4-5-91

Compound	MDL ppbv	Concentration ppbv	Concentration
	* -	ppov	ug/m3
Freon 12	0.30	not detected	not detected
Vinyl Chloride	0.30	not detected	not detected
Freon 11	0.30	not detected	not detected
1,1-Dichloroethene	0.30	not detected	not detected
Dichloromethane	0.30	2.3	8.0
Trichlorotriflouroethane	0.30	not detected	not detected
1,1-Dichloroethane	0.30	not detected	not detected
c-1,2-Dichloroethene	0.30	not detected	not detected
t-1,2-Dichloroethene	0.30	not detected	not detected
Chloroform	0.30	not detected	not detected
1.1.1-Trichloroethane	0.30	not detected	not detected
1.2-Dichloroethane	0.30	not detected	not detected
Benzene	0.30	0.50	1.6
Carbon Tetrachloride	0.30	not detected	not detected
Trichloroethene	0.30	not detected	not detected
Toluene	0.30	0.62	2.3
Tetrachloroethene	0.30	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-8-2 Can #: Bag Lab #: 10343
Date Sampled: 4-3-91
Date Analyzed: 4-5-91

Can #: Bag		Date Analyzed: 4-5-91	
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	690	3400
Vinyl Chloride	3.00	310	790
Freon 11	3.00	230	1300
1,1-Dichloroethene	3.00	26000	100000
Dichloromethane	3.00	210	720
[richlorotriflouroethane	3.00	16000	120000
1,1-Dichloroethane	3.00	80	320
c-1.2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1.1,1-Trichloroethane	3.00	250	1400
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	10	33
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	1000	5500
Toluene	3.00	not detected	not detected
Tetrachioroethene	3.00	42	280



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-B-0-8-3 Can #: Bag Lab #: 10344 Date Sampled: 4-3-91
Date Analyzed: 4-5-91

Can #: Bag		Date Anal	yzed: 4-5-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	230	1300
1,1-Dichloroethene	3.75	23000	92000
Dichloromethane	3.75	49	170
Trichlorotriflourgethane	3.75	20000	150000
1.1-Dichloroethane	3.75	100	410
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1,1,1-Trichloroethane	3.75	210	1200
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	740	4000
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	17	110



EPA M	le thod	TO-02:	GC/MS	Full	Scan
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Compoun		MDL	Concentration	• • • • • • • • • • • •
Tube #:	1004		Date Analyzed:	4-5-91
	CH2M Hill MW-S-0-3-1		Lab #: Date Sampled:	10304 3-28-91

Compound	MDL ug	Concentration ug	
Freon 12	0.001	0.326	
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.037	
l, l-Dichloroethene	0.001	not detected	
Dichloromethane	0.001	0.019	
Trichlorotriflouroethane	0.001	18.24	
l, l-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.004	
Carbon Tetrachloride	0.001	0.011	
Trichloroethene	0.001	0.024	
Toluene	0.001	0.020	
Tetrachloroethene	0.001	not detected	



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10342

 Site:
 MW-B-0-8-1
 Date Sampled:
 4-3-91

 Can #:
 Bag
 Date Analyzed:
 4-5-91

can y: Bag		Date Anal	yzed: 4-5-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	51	130
Freon 11	1.50	280	1600
1,1-Dichloroethene	1.50	20000	79000
Dichloromethane	1.50	26	91
Trichlorotriflouroethane	1.50	13000	97000
1,1-Dichloroethane	1.50	140	580
c-l,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichlorcethene	1.50	5.1	20
Chloroform	1.50	6.0	29
1.1.1-Trichloroethane	1.50	320	1800
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	9.2	30
Carbon Tetrachloride	1.50	5.9	37
Trichiproethene	1.50	750	4100
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	34	230



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10344 Duplote: 10344 D

QC Lot: 4-5-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv	RPD	QC Limits
Freon 12	not detec	not detec	• • • • •	40
Vinyl Chloride	not detec	not detec		40
Freon 11	230	150	42	-
1,1-Dichloroethene	23000	25000	8	40
Dichloromethane	49	47	4	40
Trichlorotrifluoroethane	20 000	17000	16	=
1.1-Dichloroethane	100	96	4	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	210	220	5	40
1,2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	not detec	not detac		40
Trichloroethene	740	740	0	40
Toluene	not detec	not detec	•	40
Tetrachloroethane	17	23	30	40



DUPLICATE SAMPLE, SPIKE RESULTS

Sample: 10344 Duplote: 10344 D

QC Lot: 4-5-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	230	150	42	40
1.1-Dichloroethene	23000	25000	8	40
Dichloromethane	49	47	4	40
Trichlorotrifluoroethane	20000	17000	16	40
1.1-Dichloroethane	100	96	4	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
l.l.l-Trichloroethane	210	220	5	40
1.2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	740	740	0	40
Toluene	not detec	not detec		40
Tetrachloroethane	17	23	30	40



METHOD BLANK REPORT

QC Lot: 4-5-91 Me	thod: EPA TO-14 -	GC/MS Full Scan
Compound	MDL ppbv	Blank (ppbv)
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoroe 1.1-Dichloroethane c-1.2-Dichloroethen t-1.2-Dichloroethen Chloroform 1.1.1-Trichloroetha 1.2-Dichloroethane Benzene Carbon Tetrachlorid Trichloroethene Toluene	0.50 e 0.50 e 0.50 0.50 ne 0.50 0.50	not detec
Tetrachloroethane	0.50	not detec



METHOD BLANK REPORT

QC Lot:	4-5-91 Meth	od: EPA TO-14 -	GC/MS Full Scan
	Compound	MDL ppbv	Blank (ppbv)
•••••	Freon 12 Vinyl Chloride Freon 11 1,1-Dichloroethene Dichloromethane Trichlorotrifluoroeth 1,1-Dichloroethene c-1,2-Dichloroethene t-1,2-Dichloroethene Chloroform 1,1,1-Trichloroethene 1,2-Dichloroethene Benzene Carbon Tetrachloride Trichloroethene	0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec not detec
	Toluene Tetrachloroethane	0.50 0.50	not detec not detec

ANALYTICAL RESULTS
April 5, 1991



Client: CH2M Hill Site: MW-T-0-7-B Tube #: 2019		Lab #: Date Sampled: Date Analyzed:	4-2-91
Compound	MDL ug	Concentration ug	• • • • • • • • •
Freon 12	0.001	0.002	• • • • • • • • • •
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	not detected	
l.1-Dichloroethene	0.001	not detected	
Dichloromethane	0.301	0.005	
Trichlorotriflouroethane	0.001	not detected	
l.l-Dichloroethane	0.001	not detected	
:-1,2-Dichloroethene		not detected	
	0.001	not detected	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	not detected	
l.2-Dichlorcethane	0.001	not detected	
Benzene	0.001	0.002	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0 001	0.020	

0.001

0.001

Toluene

Tetrachloroethene

not detected

0.029



EPA	Method	TO-02:	GC/MS	Full	Scan
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 Client: CH2M Hill
 Lab #: 10341

 Site: NW-S-0-8-B
 Date Sampled: 4-3-91

 Tube #: 1000
 Date Analyzed: 4-4-91

Compound	MDL ug	Concentration ug	
Freon 12	0.001	0.013	
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.003	
1.1-Dichloroethene	0.001	0.003	
Dichloromethane	0.001	0.011	
Trichlorotriflouroethane	0.001	not detected	•
1.1-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	not detected	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	0.008	
Tetrachloroethene	0.001	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-B-0-44-2 Lab #: 10445 Date Sampled: 4-9-91

Can #: Bag		Date Anal	yzed: 4-10-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1,1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	·1.50	not detected	not detected
Trichlorotriflouroethane	1.50	not detected	not detected
1,1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	not detected	not detected
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-B-0-44-3 10446 Lab #:

Date Sampled: Date Analyzed: 4-9-91 4-10-91 Can #: Bag

Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Freon 12	1.50	not detected	not detecte
Vinyl Chloride	1.50	not detected	not detecte
Freon 11	0ذ . 1	not detected	not detecte
l,l-Dichloroethene	1.50	not detected	not detecte
Dichloromethane	1.50	not detected	not detecte
Prichlorotriflouroethane	1.50	not detected	not detecte
, 1-Dichloroethane	1.50	not detected	not detecte
:-1,2-Dichloroethene	1.50	not detected	not detecte
:-1,2-Dichloroethene	1.50	not detected	not detecte
Chloroform	1.50	not detected	not detecte
1,1,1-Trichloroethane	1.50	not detected	not detecte
.2-Dichloroethane	1.50	not detected	not detecte
Senzene	1.50	not detected	not detecte
Carbon Tetrachloride	1.50	not detected	not detecte
richloroethene	1.50	not detected	not detecte
Coluene	1.50	not detected	not detecte
Tetrachloroethene	1.50	not detected	not detecte



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10447

 Site:
 VR-B-0-44-4
 Date Sampled:
 4-9-91

 Can #:
 Bag
 Date Analyzed:
 4-10-91

			4-10-71
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.38	not detected	not detected
Vinyl Chloride	1.88	not detected	not detected
Freon 11	1.88	not detected	not detected
1,1-Dichloroethene	1.88	not detected	not detected
Dichloromethane	1.88	not detected	not detected
Trichlorotriflouroethane	1.88	not detected	not detected
1,1-Dichloroethane	1.88	not detected	not detected
c-1,2-Dichloroethene	1.88	not detected	not detected
t-1,2-Dichloroethene	1.38	not detected	not detected
Chloroform	1.88	not detected	not detected
1,1,1-Trichloroethane	1.88	not detected	not detected
1,2-Dichloroethane	1 88	not detected	not detected
Benzene	1.88	not detected	not detected
Carbon Tetrachloride	1.88	not detected	not detected
Trichloroethene	1.88	not detected	not detected
Toluene	1.88	not detected	not detected
Tetrachloroethene	1.88	not detected	not detected

ANALYTICAL RESULTS
April 11, 1991



METHOD BLANK REPORT

QC Lot: 4-11-91	Method:	EPA TO-14	- GC	Z/MS	Full	Scan
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Compound	MDL ppbv	Blank (ppbv)
Freon 12	0.50	not detec
Vinyl Chloride	0.50	not detec
Freon 11	0.50	not detec
1,1-Dichloroethene	0.50	not detec
Dichloromethane	0.50	not detec
Trichlorotrifluoroethane	0.50	not detec
1,1-Dichloroethane	0.50	not detec
c-1,2-Dichloroethene	0.50	not detec
t-1,2-Dichloroethene	0.50	not detec
Chloroform	0.50	not detec
1,1,1-Trichloroethane	0.50	not detec
1,2-Dichloroethane	0.50	not detec
Benzene	0.50	not detec
Carbon Tetrachloride	0.50	not detec
Trichloroethene	0.50	not detec
Toluene	0.50	not detec
Tetrachloroethane	0.50	not detec



OUPLICATE SAMPLE/SPIKE RESULTS

Sample: 13557 Duplcte: 13557 D

QC Lot: 4-11-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv	z RPD	QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec		40
1.1-Dichloroethene	1300	1200	8	40
Dichloromethane	not detec	not detec		40
Trichlorotrifluoroethane	780	720	8	40
1,1-Dichloroethane	690	600	14	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	140	150	7	40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	1300	1700	27	40
1,2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	190	180	5	40
Toluene	not detec	not detec		40
Tetrachloroethane	28	26	7	40



EPA Met	thod	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill Site: MW-T-0-9-1 (lst) Tube #: 2010		Lab #: Date Sampled: Date Analyzed:	4-4-91 4-11-91
Compound	MDL ug	Concentration ug	
Freon 12	0.001	1.28	
Vinyl Chloride	0.001	0.061	
Freon 11	0.001	0.746	
l.l-Dichloroethene	0.001	9.35	
Dichloromethane	0.001	0.15	
Trichlorotriflouroethane	0.001	26.1	
l,l-Dichloroethane	0.001	0.006	
c-1.2-Dichlorsethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	0.091	
1.2-Dichlorsethane	0.001	not detected	
3enzene	0.001	0.006	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.053	
Toluene	0.001	0.010	
Tetrachloroethene	0.001	0.017	



EPA	Method	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill Site: MW-T-0-9-2 (1st) Tube #: 2004		Lab #: Date Sampled: Date Analyzed:	4-11-91
Compound	MDL ug	Concentration ug	
Freon 12	0.001	1.26	
Vinyl Chloride	0.001	0.054	
Freon 11	0.001	3.92	
l,l-Dichloroethene	0.001	6.50	
Dichloromethane	0.001	not detected	
Trichlorotriflouroethane	0.001	19.05	
l.l-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	0.060	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.134	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.020	
Toluene	0.001	0.339	
Tetrachloroethene	0.001	0.010	



Client: CH2M Hill Site: MW-T-0-9-3 (1st) Tube #: 2011		Lab #: Date Sampled: Date Analyzed:	4-4-91
Compound	MDL ug	Concentration ug	• • • • • • • •
Freon 12	0.001	0.038	• • • • • • • • •
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	not detected	
l.l-Dichloroethene	0.001	not detected	
Dichloromethane	0.001	not detected	
Trichlorotriflouroethane	0.001	not detected	
l,l-Dichloroethane	0.001	not detected	
c-1.2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	not detected	
l,2-Dichloroethane	0.001	not detected	
3enzene	0.001	not detected	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	not detected	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Fu		,	
Client: CH2M Hill Site: MW-T-0-6-1 (lst) Tube #: 2014		Lab #: 10399 A Date Sampled: 4-4-91 Date Analyzed: 4-11-91	
Compound	MDL ug	Concentration ug	
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotriflouroethane 1.1-Dichloroethane c-1.2-Dichloroethene t-1,2-Dichloroethene Chloroform 1.1.1-Trichloroethane	0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001	not detected	
Toluene Tetrachloroethene	0.001 0.001	0.064 0.007	



EPA Method	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill Site: MW-T-0-6-2 (lst) Tube #: 1004		Lab #: Date Sampled: Date Analyzed:	4-4-91 4-11-91
Compound	MDL ug	Concentration ug	
Freon 12	0.001	0.384	
Vinyl Chloride	0.001	not detected	
Freen 11	0.001	0.045	
l,1-Dichloroethene	0.001	0.025	
)ichloromethane	0.001	0.065	
Trichlorotriflouroethane	0.001	2.57	
l.l-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,1-Dichloroethene	0.001	0.006	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	not detected	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.074	
Toluene	0.001	0.058	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Full Scar

Client: CH2M Hill Site: MW-T-0-6-3 (1st) Tube #: 2019		Lab #: Date Sampled: Date Analyzed:	4-4-91
Compound	MDL ug	Concentration ug	•
Freon 12	0.001	0.302	• • • • • • • • • • • •
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.028	
1,1-Dichloroethene	0.001	0.014	
Dichloromethane	0.001	0.006	
Trichlorotriflouroethane	0.001	2.30	
1.1-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	0.002	
Chloroform	0.001	not detected	
1,1,1-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.002	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.024	
Toluene	0.001	0.010	
Tetrachloroethene	0.001	0.002	



EPA Method TO-02: GC/MS F			
Client: CH2M Hill Site: MW-T-0-6-4 (lst) Tube 7: 1007		Lab #: Date Sampled: Date Analyzed:	10402 A 4-4-91
Compound	MDL	Concentration ug	
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotriflouroethane 1.1-Dichloroethane c-1.2-Dichloroethene t-1.2-Dichloroethene	0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001	0.096 not detected not detected not detected 0.003 not detected not detected 0.007 0.013 0.018 not detected not detected not detected not detected 0.062 0.048 0.008	



EPA Method TO-02: GC/MS Full Scan

Tetrachloroethene

Client: CH2M Hill Site: MW-T-0-6-4 (2nd) Tube #: 1003		Lab #: 10402 Date Sampled: 4-4-9: Date Analyzed: 4-11-	1 91
Compound	MDL ug	Concentration ug	
Freon 12	0.001	0.170	••
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.014	
l,l-Dichloroethene	0.001	0.012	
Dichloromethane	0.001	0.099	
Trichlorotriflouroethane	0.001	0.320	
l.l-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	0.023	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.006	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.003	
Toluene	0.001	0.019	
Tetrachlorgethene	0.001	0.004	

0.004

0.001



	nod TO-02: GC/MS Full			
Client:	CH2M Hill MW-T-0-5-B	• • • • • • • • • • • • • • • •	Lab #: Date Sampled:	10415
Tube #:	2012		Date Analyzed:	4-11-91
Compoun	d	MDI.	Concentration	

Compound	MDL	Concentration	
	ug	u g	
Freon 12	0.001	0.003	
Vinvl Chloride	0.001	not detected	
Freon 11	0.001	not detected	
1,1-Dichloroethene	0.001	0.013	
Dichloromethane	0.001	0.013	
Trichlorotriflouroethane	0.001	not detected	
1,1-Dichloroethane	0.001	not detected	
c-1.2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	not detected	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.011	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	0.020	
Tetrachloroethene	0.001	not detected	



Client: CH2M Hill		Lab #:	10416
Site: MW-S-0-5-1		Date Sampled:	4-8-91
Tube #: 1006		Date Analyzed:	4-11-91
Compound	MDL	Concentration	•••••
	ug	ug	
Freon 12	0.001	not detected	• • • • • • • • •
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	not detected	
l.l-Dichloroethene	0.001	not detected	
Dichloromethane	0.001	not detected	
Trichlorotriflouroethane	0.001	not detected	
l.l-Dichloroethane	0.001	not detected	
c-1.2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	not detected	
l.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.002	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.028	
Toluene	0.001	0.007	
Tetrachloroethene	0.001	0.002	



EPA Method TO-02: GC/MS Full Sc

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Crient: CH2M Hill		Lab ∲:	10417
Site: MW-T-0-5-2		Date Sampled:	4-8-91
Tube #: 2005		Date Analyzed:	
Compound	MDL	Concentration	
•	ug	иg	
Freon 12	0.001	0.009	
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	not detected	
1.1-Dichloroethene	0.001	not detected	
Dichloromethane	0.001	not detected	
Trichlorotriflouroethane	0.001	not detected	
1.1-Dichloroethane	0.001	not detected	
c-1.2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	not detected	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	not detected	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Full Scan

Client:	CH2M Hill	Lab #:	10418
Site:	MW-S-0-5-3	Date Sampled:	4-8-91
Tube #:	1008	Date Analyzed:	4-11-91

Compound	MDL	Concentration	
	ug	ug	
Freon 12	0.001	not detected	
Vinyl Chloride	0.001	not detected	
Freon 11	0.001	0.032	
1,1-Dichloroethene	0.001	0.092	
Dichloromethane	0.001	0.017	
Trichlorotriflouroethane	0.001	2.34	
I,1-Dichloroethane	0.001	0.006	
c-1,2-Dichloroethene	0.001	not detected	
t-1.2-Dichloroethene	0.001	0.022	
Chloroform	0.001	not detected	
1,1.1-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
3enzene	0.001	0.001	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	0.008	
Tetrachloroethene	0.001	0.004	



EPA Method IO-02: GC/MS Fe	ull Scan	
Client: CH2M Hill Site: MW-T-0-4-B Tube #: 2018		Lab #: 10419 Date Sampled: 4-8-91 Date Analyzed: 4-11-91
Compound	MDL ug	Concentration ug
Trichlorotriflouroethane 1,1-Dichloroethane c-1,2-Dichloroethene t-1,2-Dichloroethene Chloroform 1,1,1-Trichloroethane 1,2-Dichloroethane Benzene Carbon Tetrachloride	0.001 0.001 0.001 0.001 0.001 0.001 0.001	0.029 not detected 0.009 not detected 0.011 not detected
Trichloroethene Toluene Tetrachloroethene	0.001 0.001 0.001	0.002 0.023 not detected



EPA Method TO-02: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #: 10420

 Site:
 MW-T-0-4-1
 Date Sampled: 4-8-91

 Tube #: 2026
 Date Analyzed: 4-11-91

Compound	MDL	Concentration	
	ug	ug	
Freon 12	0.001	0.083	
Vinyl Chloride	0.001	0.009	
Freon 11	0.001	0.024	
1,1-Dichloroethene	0.001	0.187	
Dichloromethane	0.001	0.018	
Trichlorotriflouroethane	0.001	1.74	
1,1-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	0.030	
Chloroform	0.001	not detected	
l.l,l-Trichloroethane	0.001	not detected	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.004	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.324	
Toluene	0.001	0.011	
Tetrachloroethene	0.001	0.004	



EPA Method TO-	·02:	GC/MS	Full	Scan
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Client: CH2M Hill Site: MW-T-0-4-2 Tube #: 2025		Lab #: Date Sampled: Date Analyzed:	
Compound	MDL ug	Concentration ug	• • • • • • • • • •
Freon 12	0.001	0.047	• • • • • • • • • •
Vinyl Chloride	0.001	not detected	
Freon il	0.001	0.015	
l.l-Dichloroethene	0.001	0.092	
Dichloromethane	0.001	0.019	
Trichlorotriflouroethane	0.001	0.998	
!.l-Dichloroethane	0.001	not detected	
c-l,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	0.030	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	not detected	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.005	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.228	
Toluene	0.001	0.009	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Full Scan

Client: CH2M Hill Lab #: 10422
Site: MW-T-0-4-3 Date Sampled: 4-8-91
Tube #: 2027 Date Analyzed: 4-11-91

Compound	MDL	Concentration		
	цg	ug		
Freon 12	0.001	0.084		
Vinyl Chloride	0.001	not detected		
Freon 11	0.001	0.024		
l.l-Dichloroethene	0.001	0.184		
Dichloromethane	0.001	0.012		
Trichlorotriflouroethane	0.001	1.73		
l.l-Dichloroethane	0.001	0.006		
c-1,2-Dichloroethene	0.001	0.001		
t-1,2-Dichloroethene	0.001	0.047		
Chloroform	0.001	0.004		
1.1,1-Trichloroethane	0.001	0.004		
1.2-Dichloroethane	0.001	not detected		
Benzene	0.001	0.005		
Carbon Tetrachloride	0.001	not detected		
Trichloroethene	0.001	0.0404		
Toluene	0.001	0.10		
Tetrachloroethene	0.001	0.005		



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10550

 Site:
 VR-B-0-42-2
 Date Sampled:
 4-10-91

 Can #:
 Bag
 Date Analyzed:
 4-11-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1,1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	8.3	29
Trichlorotriflouroethane	0.75	not detected	not detected
1,1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	7.8	30
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10551

 Site:
 VR-B-0-42-1
 Date Sampled:
 4-10-91

 Can #:
 Bag
 Date Analyzed:
 4-11-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
~ * * * * * * * * * * * * * * * * * * *		,	
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1,1-Dichloroethene	3.75	not detected	not detected
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	not detected	not detected
1,1-Dichloroethane	3.75	not detected	not detected
c-1.2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1,1,1-Trichloroethane	3.75	not detected	not detected
1,2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	not detected	not detected
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10552
Date Sampled: 4-10-91
Date Analyzed: 4-11-91 Client: CH2M Hill Site: VR-B-0-42-2 Can #: Bag

Call y. Dag		Date Analyzed. 4-11-91		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	3.75	not detected	not detected	
Vinyl Chloride	3.75	not detected	not detected	
Freon 11	3.75	not detected	not detected	
1,1-Dichloroethene	3.75	not detected	not detected	
Dichloromethane	3.75	not detected	not detected	
Trichlorotriflouroethane	3.75	6 6	500	
1.1-Dichloroethane	3.75	not detected	not detected	
c-1,2-Dichloroethene	3.75	not detected	not detected	
t-1,2-Dichloroethene	3.75	not detected	not detected	
Chloroform	3.75	not detected	not detected	
1,1,1-Trichloroethane	3.75	not detected	not detected	
1,2-Dichloroethane	3.75	not detected	not detected	
Benzene	3.75	not detected	not detected	
Carbon Tetrachloride	3.75	not detected	not detected	
Trichloroethene	3.75	not detected	not detected	
Toluene	3.75	not detected	not detected	
Tetrachloroethene	3.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10553
Date Sampled: 4-10-91
Date Analyzed: 4-11-91 Client: CH2M Hill Site: VR-B-0-42-3 Can #: Bag

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	not detected	not detected
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	not detected	not detected
1,1-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	not detected	not detected
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	not detected	not detected
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10554

 Site:
 VR-B-0-42-4
 Date Sampled:
 4-10-91

 Can #:
 Bag
 Date Analyzed:
 4-11-91

Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/ m 3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	not detected	not detected
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	52	400
1.1-Dichloroethane	3.75	not detected	not detected
c-1.2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	not detected	not detected
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	not detected	not, detected
Toluene	3.75	10	39
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10555

 Site:
 VR-B-0-61-B
 Date Sampled:
 4-10-91

 Can #:
 Bag
 Date Analyzed:
 4-11-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.50	not detected	not detected
Vinyl Chloride	0.50	not detected	not detected
Freon 11	0.50	not detected	not detected
1,1-Dichloroethene	0.50	not detected	not detected
Dichloromethane	0.50	3.7	13
Trichlorotriflouroethane	0.50	not detected	not detected
1.1-Dichloroethane	0.50	not detected	not detected
c-1,2-Dichloroethene	0.50	not detected	not detected
t-1,2-Dichloroethene	0.50	not detected	not detected
Chloroform	0.50	not detected	not detected
1,1,1-Trichloroethane	0.50	not detected	not detected
1,2-Dichloroethane	0.50	not detected	not detected
Benzene	0.50	not detected	not detected
Carbon Tetrachloride	0.50	not detected	not detected
Trichloroethene	0.50	not detected	not detected
Toluene	0.50	not detected	not detected
Tetrachloroethene	0.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10556
Date Sampled: 4-10-91
Date Analyzed: 4-11-91 Client: CH2M Hill

Site: VR-B-0-61-1 Can #: Bag

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1,1-Dichloroethene	3.00	1000	4100
Dichloromethane	3.00	not detected	not detected
richlorotriflouroethane	3.00	690	5300
1,1-Dichloroethane	3.00	720	2900
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	150	580
Chloroform	3.00	not detected	not detected
1.1.1-Trichloroethane	3.00	1300	7000
1,2-Dichloroethane	. 3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	160	860
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	30	210



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10557
Date Sampled: 4-10-91
Date Analyzed: 4-11-91 Site: VR-B-0-61-2 Can #: Bag

Can 7. Dag		nere west	/2ed: 4-11-71
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1,1-Dichloroethene	3.00	1300	5100
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	780	6000
l, l-Dichloroethane	3.00	690	2800
c-1.2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	140	560
Chloroform	3.00	not detected	not detected
1,1,1-Trichloroethane	3.00	1300	7100
1,2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	190	1000
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	28	190

ANALYTICAL REPORT
April 12, 1991



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10557 D

 Site:
 VR-B-0-61-2
 Date Sampled:
 4-10-91

 Can #:
 Bag
 Date Analyzed:
 4-11-91

Call 4. Sag		5660 inner/200. 4 22 72		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	3.00	not detected	not detected	
Vinyl Chloride	3.00	not detected	not detected	
Freon 11	3.00	not detected	not detected	
1,1-Dichloroethene	3.00	1200	4700	
Dichloromethane	3.00	not detected	not detected	
Trichlorotriflouroethane	3.00	720	5500	
1.1-Dichloroethane	3.00	600	2400	
c-1,2-Dichloroethene	3.00	not detected	not detected	
t-1.2-Dichloroethene	3.00	150	610	
Chloroform	3.00	not detected	not detected	
1.1.1-Trichloroethane	3.00	1700	9400	
1.2-Dichloroethane	3.00	not detected	not detected	
Senzene	3.00	not detected	not detected	
Carbon Tetrachloride	3.00	not detected	not detected	
Trichloroethene	3.00	180	990	
Toluene	3.00	not detected	not detected	
Tetrachloroethene	3.00	26	180	



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10559

 Site:
 VR-B-0-34-B
 Date Sampled:
 4-10-91

 Can #:
 Bag
 Date Analyzed:
 4-11-91

can y. Dag			7-11-71
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.50	not detected	not detected
Vinyl Chloride	0.50	not detected	not detected
Freon 11	0.50	not detected	not detected
1.1-Dichloroethene	0.50	not detected	not detected
Dichloromethane	0.50	4.5	16
Trichlorotriflouroethane	0.50	not detected	not detected
1.1-Dichloroethane	0.50	not detected	not detected
c-1,2-Dichloroethene	0.50	not detected	not detected
t-1,2-Dichloroethene	0.50	not detected	not detected
Chloroform	0.50	not detected	not detected
1,1,1-Trichloroethane	0.50	not der sted	not detected
1,2-Dichloroethane	0.50	not de loted	not detected
Benzene	0.50	not : ted	not detected
Carbon Tetrachloride	0.50	not cted	not detected
Trichloroethene	0.50	not a sected	not detected
Toluene	0.50	11	41
Tetrachloroethene	0.50	not detected	not detected



QC Lot: 4-12-91 Method	EPA TO-14 - GC/MS Full Scan
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Compound	MDL ppbv	Blank (ppbv)
Freon 12	0.50	not detec
Vinyl Chloride	0.50	not detec
Freon 11	0.50	not detec
1,1-Dichloroethene	0.50	not detec
Dichloromethane	0.50	not detec
Trichlorotrifluoroethane	0.50	not detec
1,1-Dichloroethane	0.50	not detec
c-1,2-Dichloroethene	0.50	not detec
t-1,2-Dichloroethene	0.50	not detec
Chloroform	0.50	not detec
1,1,1-Trichloroethane	0.50	not detec
1,2-Dichloroethane	0.50	not detec
Benzene	0.50	not detec
Carbon Tetrachloride	0.50	not detec
Trichloroethene	0.50	not detec
Toluene	0.50	not detec
Tetrachloroethane	0.50	not detec



QC Lot: 4-12-91 Metho		GC/MS Full Scan
Compound	MDL ppbv	Blank (ppbv)
Freon 12	0.50	not detec
Vinyl Chloride	0.50	not detec
Freon 11	0.50	not detec
1,1-Dichloroethene	0.50	not detec
Dichloromethane	0.50	not detec
Trichlorotrifluoroetha	ne 0.50	not detec
1.1-Dichloroethane	0.50	not detec
c-1,2-Dichloroethene	0.50	not detec
t-1,2-Dichloroethene	0.50	not detec
Chloroform	0.50	not detec
1.1.1-Trichloroethane	0.50	not detec
1,2-Dichloroethane	0.50	not detec
Benzene	0.50	not detec
Carbon Tetrachloride	0.50	not detec
Trichloroethene	0.50	not detec
Toluene	0.50	not detec
Tetrachloroethane	0.50	not detec



Sample: 10352 Duplcte: 10352 D

QC Lot: 4-12-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	59	85	36	40
Vinyl Chloride	81	100	21	40
Freon 11	210	310	38	40
l, l-Dichloroethene	19000	26000	31	40
Dichloromethane	37	21	55	40
Trichlorotrifluoroethane	9800	13000	28	40
l,1-Dichloroethane	88	130	39	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
l,l,l-Trichloroethane	330	310	6	40
1.2-Dichloroethane	not detec	not detec		40
Benzene	11	12	9	40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	970	950	2	40
Toluene	not detec	not detec		40
Tetrachloroethane	46	43	7	40



Sample: 10352 Duplote: 10352 D

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	59	85	36	40
Vinyl Chloride	81	100	21	40
Freon 11	210	310	38	40
1.1-Dichloroethene	19000	26000	31	40
Dichloromethane	37	21	55	40
Trichlorotrifluoroethane	9800	13000	28	40
1.1-Dichloroethane	88	130	39	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	330	310	6	40
1,2-Dichloroethane	not detec	not detec		40
Benzene	11	12	9	40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	970	950	2	40
Toluene	not detec	not detec		40
Tetrachloroethane	46	43	7	40



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-8-2 Can #: 65 Lab #: 10348
Date Sampled: 4-3-91
Date Analyzed: 4-12-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	160	800
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	110	630
1,1-Dichloroethene	1.50	9200	37000
Dichloromethane	1.50	73	260
Trichlorotriflouroethane	1.50	5400	41000
1,1-Dichloroethane	1.50	43	180
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1.2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	71	390
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	320	1700
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	11	77



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-8-3 Can #: 123 Lab #: 10349
Date Sampled: 4-3-91
Date Analyzed: 4-12-91

Compound	MDL ppbv	Concentration ppbv	ug/m3
Freon 12	1.88	170	830
Vinyl Chloride	1.88	not detected	not detected
Freon 11	1.88	140	770
1.1-Dichloroethene	1.88	11000	43000
Dichloromethane	1.88	28	98
Trichlorotriflouroethane	1.88	5500	42000
l.l-Dichloroethane	1.88	62	250
c-l.2-Dichloroethene	1.88	not detected	not detected
t-1,2-Dichloroethene	1.88	not detected	not detected
Chloroform	1.88	not detected	not detected
1.1.1-Trichloroethane	1.88	160	870
1.2-Dichloroethane	1.88	not detected	not detected
Benzene	1.88	not detected	not detected
Carbon Tetrachloride	1.88	not detected	not detected
Trichloroethene	1.88	440	2400
Toluene	1.88	not detected	not detected
Tetrachloroethene	1.88	18	120



EPA Method TO-14: GC/MS Full Scan

Lab #: 10350
Date Sampled: 4-3-91
Date Analyzed: 4-12-91 Client: CH2M Hill Site: MW-PC-0-8-4 Can #: 47

Can #: 4/			yzed: 4-12-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	280	1400
Vinyl Chloride	3.00	160	400
Freon 11	3.00	210	1200
1.1-Dichloroethene	3.00	21000	84000
Dichloromethane	3.00	not detected	not detected
!richlorotriflouroethane	3.00	10000	79000
l.l-Dichloroethane	3.00	90	360
c-1.2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	not detected	nut detected
Chloroform	3.00	not detected	not detected
1,1.1-Trichloroethane	3.00	240	1300
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	820	4400
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	38	260



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: . 10352
Site: MW-PC-0-8-6 Date Sampled: 4-3-91
Can #: 98 Date Analyzed: 4-12-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	3.00	59	290	
Vinyl Chloride	3.00	81	210	
Freon 11	3.00	210	1200 ·	
1.1-Dichloroethene	3.00	19000	76000	
Dichloromethane	3.00	37	130	
Trichlorotriflouroethane	3.00	9800	75000	
1,1-Dichloroethane	3.00	88	360	
c-1.2-Dichloroethene	3.00	not detected	not detected	
t-1,2-Dichloroethene	3.00	4.8	19	
Chloroform	3.00	not detected	not detected	
1.1.1-Trichloroethane	3.00	330	1800	
1.2-Dichloroethane	3.00	not detected	not detected	
Benzene	3.00	11	35	
Carbon Tetrachloride	3.00	not detected	not detected	
Trichloroethene	3.00	970	5200	
Toluene	3.00	not detected	not detected	
Tetrachloroethene	3.00	46	310	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10352 D

Site: MW-PC-0-8-6 Date Sampled: 4-3-91

Can #: 98

Can #: 98		Date Analy	zed: 4-12-91
Compound	MDL ppbv	Concentration	Concentration ug/m3
Freon 12	3.00	85	420
Vinyl Chloride	3.00	100	270
Freon 11	3.00	310	1800
1,1-Dichloroethene	3.00	26000	100000
Dichloromethane	3.00	21	73
Trichlorotriflouroethane	3.00	13000	99000
1.1-Dichloroethane	3.00	130	510
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1,1 1-Trichloroethans	3.00	310	1700
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	12	38
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	950	5100
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	43	290



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10558

 Site:
 VR-B-0-61-3
 Date Sampled:
 4-3-91

 Can #:
 Bag
 Date Analyzed:
 4-12-91

Can #: Bag		Date Analy	yzed: 4-12-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1,1-Dichloroethene	3.00	960	3800
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	630	4900
1.1-Dichloroethane	3.00	390	1600
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	. 130	500
Chloroform	3.00	not detected	not detected
1.1.1-Trichloroethane	3.00	1800	9800
1,2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	210	1100
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	32	220



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-9-2 Can #: 400 10365 Lab #: Date Sampled: 4-3-91
Date Analyzed: 4-12-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	66	370
1,1-Dichloroethene	1.50	5400	22000
.chloromethane	1.50	27	93
'richlorotriflouroethane	1.50	3900	30000
1.1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	26	140
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	31	170
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-9-3 Can #: 57 Lab #: 10366
Date Sampled: 4-4-91
Date Analyzed: 4-12-91

Can #. 57		Date Anal	yzed: 4-12-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	17	82
Vinyl Chloride .	1.50	not detected	not detected
Freon 11	1.50	50	290
1,1-Dichloroethene	1.50	6700	27000
Dichloromethane	1.50	21	74
Trichlorotriflouroethane	1.50	4800	37000
1,1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	24	130
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	25	130
Toluene	1.50	5.00	19
Tetrachloroethene	1.50	not detected	not detected

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QC Lot:	4-13-91 Metho	d: EPA TO-14 - G	C/MS Full Scan
	Compound	MDL ppbv	Blank (ppbv)
	Freon 12	0.50	not detec
	Vinyl Chloride	0.50	not detec
	Freon 11	0.50	not detec
	1,1-Dichloroethene	0.50	not detec
	Dichloromethane	0.50	not detec
	Trichlorotrifluoroetha	ne 0.50	not detec
	1,1-Dichloroethane	0.50	not detec
	c-1,2-Dichloroethene	0.50	not detec
	t-1,2-Dichloroethene	0.50	not detec
	Chloroform	0.50	not detec
	1,1,1-Trichloroethane	0.50	not detec
	1,2-Dichloroethane	0.50	not detec
	Benzene	0.50	not detec
	Carbon Tetrachloride	0.50	not detec
	Trichloroethene	0.50	not detec
	Toluene	0.50	not detec
	Tetrachloroethane	0.50	not detec



QC Lot:	4-13-91	fethod:	EPA TO-14	- GC/MS Ful	l Scan
	Compound		abpa WDL		lank pbv)
	Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoro 1.1-Dichloroethene c-1.2-Dichloroethe Chloroform 1.1.1-Trichloroeth 1.2-Dichloroethane Senzene Carbon Tetrachloride	pethane ene ene ene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not not not not not not not not	detec
	Trichloroethene Toluene Tetrachloroethane		0.50 0.50 0.50	not not	detec detec detec



QC Lot:	4-13-91 Me		- GC/MS Full Scan
	Compound	DPpA WDL	Blank (ppbv)
	Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoroethene c-1.2-Dichloroethene c-1.2-Dichloroethene Chloroform 1.1.1-Trichloroethene 1.2-Dichloroethene Chloroform 2.1.1-Trichloroethene Carbon Tetrachlorice Carbon Tetrachlorice	0.50 ne 0.50 ne 0.50 0.50 0.50 0.50 0.50	not detect
	Trichloroethene Toluene Tetrachloroethane	0.50 0.50 0.50	not detec not detec not detec



QC Lot: 4	4-13-91	fethod: EP	A TO-14 - GC/MS	Full Scan
0	Compound		MDL ppbv	Blank (ppbv)
V F 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Freon 12 Jinyl Chloride Freon 11 L.1-Dichloroethene Dichloromethane Frichlorotrifluoro L.1-Dichloroethene L.1-Dichloroethe L.1-Trichloroethe L.1-Trichloroethe L.1-Trichloroethe L.1-Dichloroethene Frichloroethene Foluene	ethane ene ene nane	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec
I	Tetrachloroethane		0.50	not detec



Sample: 10560 Suplcte: 10560 D

QC Lot: 4-13-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Li m its
Freon 12	nor detec	not detec		30
Vinyl Chloride	not detec	not detec		30
Freon 11	not detec	not detec		30
1.1-Dichloroethene	850	740	14	30
Dichloromethane	not detec	not detec		30
Trichlorotrifluoroethane	390	350	11	30
1.1-Dichloroethane	not detec	not detec		30
c-1.2-Dichloroethene	not detec	not detec		30
t-1,2-Dichloroethene	not detec	not detec		30
Chloroform	not detec	not detec		30
1,1.1-Trichloroethane	510	500	2	30
1.2-Dichloroethane	not detec	not detec		30
Benzene	not detec	not detec		30
Carbon Tetrachloride	not detec	not detec		30
Trichloroethene	94	93	1	30
Toluene	not detec	not detec	_	30
Tetrachloroethane	not detec	not detec		30



Sample: 10560 Duplote: 10560 D QC Lot: 4-13-91

Compound	Pi	Sample ppbv		Duplicate ppbv		QC Limits
Freon 12				detec		
		detec				40
Vinyl Chloride		detec		detec		40
Freon 11		detec		detec		40
l,l-Dichloroethene	850		740		14	40
Dichloromethane	not	detec	not	detec		40
[richlorotrifluoroethane	390		350		11	40
l.l-Dichloroethane	not	detec	not	detec		40
:-1,2-Dichloroethene	not	detec	not	detec		40
t-1,2-Dichloroethene	not	detec	not	detec		40
Chloroform	not	detec	not	detec		40
l.l.l-Trichloroethane	510		500		2	40
1,2-Dichloroethane	not	detec	not	detec		40
Benzene	not	detec	not	detec		40
Carbon Tetrachloride	not	detec	not	detec		40
Trichloroethene	94		93		1	40
Poluene	not	detec	not	detec		40
Tetrachloroethane	not	detec	not	detec		40



Sample: 10560 Duplote: 10560 D

QC Lot: 4-13-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv		Duplicate ppbv			QC Limits
Freon 12	not d	erec	200	detec		
Vinvl Chloride	not d			detec		40
reon 11	not d					40
.1-Dichloroethene	850	etet	740	detec	• •	40
chloromethane	not d		_		14	40
richlorotrifluoroethane	390	etec		detec		40
.,1-Dichloroethane			350		11	40
-1.2-Dichloroethene	not d			detec		.40
-1.2-Dichloroethene	not d			detec		40
hloroform	not d			detec		40
	not d	etec		detec		40
.1.1-Trichloroethane	510		500		2	40
.2-Dichloroethane	not d	etec	not	detec		40
enzene	not d	etec	not	detec		40
arbon Tetrachloride	not d	etec	not	detec		40
richloroethene	94		93		1	40
oluene	not d	etec	not	detec		40
etrachloroethane	not d	etec	not	detec		40



Sample: 10560 Duplote: 10550 D QC Lot: 4-13-91

QC Lot: 4-13-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	79	ple bv	•	licate pbv		QC Limits
Freon 12		detec	not	detec		40
Vinyl Chloride	not	detec	not	detec		40
Freon 11	not	detec	not	detec		40
l.l-Dichloroethene	850		740		14	40
Dichloromethane	not	detec	not	detec		40
Trichlorotrifluoroethane	390		350		11	40
l.l-Dichloroethane	not	detec	not	detec		40
:-1,2-Dichloroethene	not	detec	not	detec		40
t-1,2-Dichloroethene	not	detec	not	detec		40
Chloroform	not	detec	not	detec		40
l.l,l-Trichloroethane	510		500		2	40
1,2-Dichloroethane	not	detec	not	detec		40
Benzene	not	detec	not	detec		40
Carbon Tetrachloride	not	detec	not	detec		40
Trichloroethene	94		93		1	40
Toluene .	not	detec	not	detec		40
Tetrachloroethane	not	detec	not	detec		40



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-9-B Can #: 79 Lab #: 10363
Date Sampled: 4-4-91
Date Analyzed: 4-13-91

Can #: 79			zed: 4-13-91
Compound	MDL ppbv	Concentration ppbv	ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
l.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	not detected	not detected
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	89	500
1.1-Dichloroethene	1.50	8400	34000
Dichloromethane	1.50	17	61
Trichlorotriflouroethane	1.50	6700	51000
1,1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	24	130
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	27	150
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10393
Date Sampled: 4-6-91 Client: CH2M Hill

Site: MW-AC-0-6-B

Can #: 16		Date Analy:	zed: 4-13-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
l,1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	11	39
Trichlorotriflouroethane	1.50	not detected	not detected
l.1-Dichloroethane	1.50	not detected	not detected
c-1.2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichlorcethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
l.l.l-Trichloroethane	1.50	not detected	not detected
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10395
Site: MW-AC-0-6-2 Date Sampled: 4-6-91
Can #: 91 Date Analyzed: 4-13-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	14	67
Vinvl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1.1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	not detected	not detected
Trichlorotrifloursethane	1.50	270	2100
1.1-Dichloroethane	1.50	not detected	not detected
c-1.2-Dichloroethene	1.50	not detected	not detected
t-1.2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	not detected	not detected
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	29	150
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 10396 Date Sampled: 4-6-91 Client: CH2M Hill

Site: MW-AC-0-6-3

Can #: 114		Date Analy	/zed: 4-13-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	12	57
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1.1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	not detected	not detected
Trichlorotriflouroethane	1.50	240	1800
1,1-Dichloroethane	1.50	not detected	not detected
c-l,2-Dichloroethene	1.50	not detected	not detected
t-1.2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	not detected	not detected
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	25	140
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10409

 Site:
 MW-AC-0-5-2
 Date Sampled:
 4-8-91

 Can #:
 105
 Date Analyzed:
 4-13-91

Compound	MDL MDL	Concentration ppbv	Concentration ug/m3
Page 13			
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1.1-Dichloroethene	3.00	not detected	not detected
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	not detected	not detected
1.1-Dichloroethane	3.00	not detected	not detected
c-1.2-Dichloroethene	3.00	not detected	not detected
t-1.2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1.1.1-Trichloroethane	3.00	not detected	not detected
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	not detected	not detected
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10560

 Site:
 VR-B-0-34-1
 Date Sampled:
 4-10-91

 Can #:
 Bag
 Date Analyzed:
 4-13-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	850	3400
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	390	3000
1.1-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1,1-Trichloroethane	3.75	510	2800
1.2-Dichloroethane	3.75	not detected	not detected
Senzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	94	510
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10560 D
Site: VR-B-0-34-1 Date Sampled: 4-10-91
Can #: Bag Date Analyzed: 4-13-91

Can . Dag			.ed. 4-13-91
Compound	bbpл WDГ	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	net detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
l, l-Dichloroethene	3.75	740	2900
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	350	2700
1.1-Dichloroethane	3.75	not detected	not detected
c-l.2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
l.l.l-Trichloroethane	3.75	500	2700
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	93	500
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10561
Site: VR-B-0-34-2 Date Sampled: 4-10-91
Can #: Bag Date Analyzed: 4-13-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1,1-Dichlorsethene	3.75	670	2700
Dichloromethane	3.75	not detected	1600
chlorotriflouroethane	3.75	440	not detected
1-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1,1,1-Trichloroethane	3.75	570	3100
1,2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	100	550
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected

ANALYTICAL RESULTS
April 14, 1991



METHOD BLANK REPORT

QC Lot: 4-14-91 Method:	EPA TO-14 -	GC/MS Full Scan
Jo mpound	MDL ppbv	Blank (ppbv)
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoroethane 1.1-Dichloroethane c-1.2-Dichloroethene t-1.2-Dichloroethene Chloroform 1.1.1-Trichloroethane 1.2-Dichloroethane Benzene Carbon Tetrachloride Trichloroethene Toluene Tetrachloroethane	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec



METHOD BLANK REPORT

QC Lot: 4-14-91 Method: EPA T	ro-14 -	GC/MS F	ull Scan
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MDL ppbv	Blank (ppbv)
0.50	not detec
	MDL ppbv 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.5



Sample: 10562 Duplote: 10562 D

QC Lot: 4-14-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC . Limits	
Freon 12	not detec	not detec	• • • • • • •	40	
Vinyl Chloride	not detec	not detec		40	
Freon 11	not detec	not detec		40	
l.1-Dichloroethene	not detec	not detec	18	40	
Dichloromethane	not detec	not detec		40	
[richlorotrifluoroethane	not detec	not detec	18	40	
l,l-Dichloroethane	not detec	not detec		40	
:-1.2-Dichloroethene	not detec	not detec		40	
:-1,2-Dichloroethene	not detec	not detec		40	
Chloroform	not detec	not detec		40	
l,l.l-Trichloroethane	not detec	not detec	0	40	
L,2-Dichloroethane	not detec	not detec		40	
Benzene	not detec	not detec		40	
Carbon Tetrachloride	not detec	not detec		40	
Trichloroethene	not detec	not detec	2	40	
Coluene	not detec	not detec		40	
Tetrachloroethane	not detec	not detec		40	



Sample: 10562 Duplote: 10562 D QC Lot: 4-14-91

QC Lot: 4-14-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec		40
Vinyl Chloride	not detec	not detec		40
Freon 11	not detec	not detec		40
1.1-Dichloroethene	not detec	not detec	18	40
Dichloromethane	not detec	not detec		40
Trichlorotrifluoroethane	not detec	not detec	18	40
l,l-Dichloroethane	not detec	not detec		40
c-l,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	not detec	not detec	0	40
1,2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	not detec	not detec	2	40
Toluene	not detec	not detec		40
Tetrachloroethane	not detec	not detec		40



Sample: 10562 Duplote: 10562 D

QC Lot: 4-14-91 Method: EPA TO-14 - GC/MS Full Scan

Sompound	Sample ppbv	Duplicate ppbv		QC Limits	
Freon 12	not detec	not detec		30	
Vinvl Chloride	not detec	not detec		30	
Freon 11	not detec	not detec		30	
1.1-Dichloroethene	not detec	not detec	18	30	
Dichloromethane	not detec	not detec		30	
Trichlorotrifluoroethane	not detec	not detec	18	30	
1,1-Dichloroethane	not detec	not detec		30	
c-1,2-Dichloroethene	not detec	not detec		30	
t-1,2-Dichloroethene	not detec	not detec		30	
Chloroform	not detel	not detec		30	
1.1.1-Trichloroethane	not detec	not detec	0	30	
1,2-Dichloroethane	not detec	not detec		30	
Benzene	not detec	not detec		30	
Carbon Tetrachloride	not detec	not detec		30	
Trichloroethene	not detec	not detec	2	30	
Toluene	not detec	not detec		30	
Tetrachloroethane	not detec	not detec		30	



EPA Method TO-14: GC/MS Full Scan

Lab #: 10562
Date Sampled: 4-10-91
Date Analyzed: 4-14-91 Client: CH2M Hill Site: VR-B-0-34-3 Can #: Bag

		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
MDL ppbv	Concentration ppbv	Concentration ug/m3
3.75	not detected	not detected
3.75	not detected	not detected
3.75	not detected	not detected
3.75	400	1600
3.75	not detected	not detected
3.75	250	190 0
3.75	not detected	not detected
3.75	not detected	not detected
3.75	not detected	not detected
3.75	not detected	not detected
3.75	490	2700
3.75	not detected	not detected
3.75	not detected	not detected
3.75	not detected	not detected
3.75	81	440
3.75	not detected	not detected
3.75	not detected	not detected
	MDL ppbv 3.75 3.75 3.75 3.75 3.75 3.75 3.75 3.75	3.75 not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-B-0-34-3 Can #: Bag Lab #: 10562 D
Date Sampled: 4-10-91
Date Analyzed: 4-14-91

Can #: Bag		Date Analy	/zed: 4-14-91
Compound	MDL ppbv	Concentration ppbv	ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	480	1900
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	300	2300
l.l-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	490	2700
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	83	444
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



VOLATILE ORGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-14: GC/MS	Full	Scan
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Client: CH2M Hill		Lab #:	
Site: VR-B-0-34-4		•	4-10-91
Can #: Bag		Date Analyzed	: 4-14-91
Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
l.l-Dichloroethene	3.00	680	2700
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	340	2600
1.1-Dichloroethane	3.00	not detected	not detected
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1.1,1-Trichloroethane	3.00	280	1500
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	63	340
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client:	CH2M Hill	Lab #:	10582
Site:	VR-B-0-35-1	Date Sampled:	4-11-91
Can ∲:	Bag	Date Analyzed:	4-14-91

Can 7. Dag		Date Hilly	260. 4-14-71
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1.1-Dichloroethene	3.00	330	1300
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	230	170 0
',1-Dichloroethane	3.00	not detected	not detected
-1,2-Dichloroethene	3.00	not detected	not detected
c-l,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1.1.1-Trichlorcethane	3.00	250	1400
1,2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	63	340
Toluene	3.00	7.1	27
Tetrachloroethene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #:

Client: CH2M Hill Site: VR-B-0-35-2 Can #: Bag Lab #: 10583
Date Sampled: 4-11-91
Date Analyzed: 4-14-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinvl Chloride	3.75	not detected	not detected
Freen 11	3.75		
		not detected	not detected
1.1-Dichloroethene	3.75	240	960
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	200	150 0
1,1-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	320	1700
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	68	360
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10584
Site: VR-B-0-35-3 Date Sampled: 4-11-91
Can #: Bag Date Analyzed: 4-14-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freen 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	350	1400
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	240	1800
l.l-Dichloroethane	3.75	not detected	not detected
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	310	1700
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	nor detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	61	330
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10586

 Site:
 VR-B-0-39-B
 Date Sampled:
 4-11-91

 Can #:
 Bag
 Date Analyzed:
 4-14-91

Compound	MDL PPbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinvl Chloride	0.75	not detected	not detected
Freon 11	0.75	19	110
l.l-Dichloroethene	· 0.75	not detected	not detected
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	not detected	not detected
1,1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1,1,1-Trichloroethane	0.75	150	810
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	1.5	4.8
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	30	110
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10587

 Site:
 VR-B-0-39-2
 Date Sampled:
 4-11-91

 Can #:
 Bag
 Date Analyzed:
 4-14-91

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Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1.1-Dichloroethene	3.00	53	210
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	54	410
1.1-Dichloroethane	3.00	not detected	not detected
-1.2-Dichloroethene	3.00	not detected	not detected
2-1,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1.1.1-Trichloroethane	3.00	85	460
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	9.7	52
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10588
Site: VR-B-0-39-2 Date Sampled: 4-11-91

Can #: Bag		Date Analyzed:	
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
l.l-Dichloroethene	3.75	82	330
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	88	680
1,1-Dichloroethane	3.75	not detected	not detected
c-l,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1,1.1-Trichloroethane	3.75	56	300
1.2-Dichloroethane	3.75	not defected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	not detected	not detected
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 3093

 Site:
 VR-AC-C-42-2
 Date Sampled:
 4-10-91

 Can #:
 P100
 Date Analyzed:
 4-14-91

Can w. F150		Date Maly	zed: 4-14-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	2.50	not detected	not detected
Vinyl Chloride	2.50	not detected	not detected
Freon 11	2.50	not detected	not detected
1.1-Dichloroethene	2.50	not detected	not detected
Dichloromethane	2.50	3.1	11
Trichlorotriflouroethane	2.50	51	390
1,1-Dichloroethane	2.50	not detected	not detected
c-1,2-Dichloroethene	2.50	not detected	not detected
t-1.2-Dichloroethene	2.50	not detected	not detected
Chloroform	2.50	not detected	not detected
1,1,1-Trichloroethane	2.50	3.6	20
1.2-Dichloroethane	2.50	not detected	not detected
Benzene	2.50	not detected	not detected
Carbon Tetrachloride	2.50	not detected	not detected
Trichloroethene	2.50	not detected	not detected
Toluene	2.50	not detected	not detected
Tetrachloroethene	2.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #: 3094

 Site:
 VR-AC-C-42-3
 Date Sampled: 4-10-91

 Can #:
 P95
 Date Analyzed: 4-14-91

Compound	MDL	Concentration	Concentration
***************************************	ppbv	ppbv	ug/m3
Freon 12	2.50	not detected	not detec
Vinyl Chloride	2.50	not detected	not detec
Freon 11	2.50	not detected	not detec
1,1-Dichloroethene	2.50	not detected	not detec
Dichloromethane	2.50	not detected	not detec
Trichlorotriflouroethane	2.50	49	380
1.1-Dichloroethane	2.50	not detected	not detec
c-1.2-Dichloroethene	2.50	not detected	not detec
t-1.2-Dichloroethene	2.50	not detected	not detec
Chloroform	2.50	not detected	not detec
1.1.1-Trichloroethane	2.50	6.5	35
1.2-Dichloroethane	2.50	not detected	not detec
Benzene	2.50	not detected	not detec
Carbon Tetrachloride	2.50	not detected	not detec
Trichloroethene	2.50	not detected	not detec
Toluene	2.50	not detected	not detec
Tetrachloroethene	2.50	not detected	not detec



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-AC-C-61-4

Can #: P99			zed: 4-14-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	3.3	19
1.1-Dichloroethene	1.50	870	3400
Dichloromethane	1.50	not detected	not detected
Trichlorotriflouroethane	1.50	450	3400
1,1-Dichloroethane	1.50	550	2200
-1,2-Dichloroethene	1.50	8.7	34
t-1,2-Dichloroethene	1.50	530	2100
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	360	2000
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	34	180
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	6.1	42



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-AC-C-42-B Can #: P79 Lab #: Date Sampled: 4-10-91
Date Analyzed: 4-14-91

Call #, F/7		Date Analyzed. 4-1	
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.7 5	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	1.5	5.2
Trichlorotriflouroethane	0.75	not detected	not detected
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 3097

 Site:
 VR-AC-C-42-1
 Date Sampled:
 4-10-91

 Can #:
 P90
 Date Analyzed:
 4-14-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	3.75	not detected	not detected	
Vinvl Chloride	3.75	not detected	not detected	
Freon 11	3.75	not detected	not detected	
1,1-Dichloroethene	3.75	not detected	not detected	
Dichloromethane	3.75	8.8	31	
Trichlorotriflouroethane	3.75	63	480	
1.1-Dichloroethane	3.75	not detected	not detected	
c-1.2-Dichloroethene	3.75	not detected	not detected	
t-1,2-Dichloroethene	3.75	not detected	not detected	
Chloroform	3.75	not detected	not detected	
1.1.1-Trichloroethane	3.75	5.1	28	
1.2-Dichloroethane	3.75	not detected	not detected	
Benzene	3.75	not detected	not detected	
Carbon Tetrachloride	3.75	not detected	not detected	
Trichloroethene	3.75	not detected	not detected	
Toluene	3.75	not detected	not detected	
Tetrachloroethene	3.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

.....

 Client:
 CH2M Hill
 Lab #:
 3100

 Site:
 VR-AC-C-61-3
 Date Sampled:
 4-10-91

 Can #:
 Pl01
 Date Analyzed:
 4-14-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1.1-Dichloroethene	1.50	870	3500
Dichloromethane	1.50	2.2	7.6
Trichlorotriflouroethane	1.50	not detected	not detected
1,1-Dichloroethane	1.50	400	1600
c-1.2-Dichloroethene	1.50	8.7	35
t-1,2-Dichloroethene	1.50	370	1500
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	360	1900
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	nor detected	not detected
Carbon Tetrachloride	1.50	nor detected	not detected
Trichloroethene	1.50	32	170
Toluene	1.50	nor detected	not detected
Tetrachloroethene	1.50	4.7	32



EPA Method TO-14: GC, MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 3128

 Site:
 VR-AC-C-13-B
 Date Sampled:
 4-12-91

 Can #:
 P140
 P140
 P140

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	2.3	8.1
Trichlorotriflouroethane	0.75	2.1	16
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



not detected

WOLATTLE ORGANIC COMPOUND ANALYSIS REPORT

EPA Method TO-14: GC/MS Full Scan

Tetrachloroethene

....... Client: CH2M Hill Lab #: Site: VR-AC-C-13-1

Date Sampled: 4-12-91
Date Analyzed: 4-14-91 Can #: P150 Concentration Concentration Compound MDL ppbv ppbv 1.00 not detected Freon 12 not detected Vinyl Chloride 1.00 not detected not detected Freon 11 1.00 not detected not detected 1.1-Dichloroethene 1.00 not detected not detected 1.00 2.1 7.2 Dichloromethane Trichlorotriflouroethane 1.00 1.1-Dichloroethane 1.00 2.4 18 not detected not detected c-1.2-Dichloroethene 1.00 not detected not detected 1.00 t-1,2-Dichloroethene not detected not detected not detected Chloroform 1.00 not detected 1.00 1.1.1-Trichloroethane not detected not detected 1.00 1.2-Dichloroethane not detected not detected 1.00 not detected 1.3 Benzene 1.00 Carbon Tetrachloride not detected not detected not detected Trichloroethene 1.00 not detected 1.00 Toluene not detected 1.8

1.00 not detected

ANALYTICAL RESULTS
April 15, 1991



METHOD BLANK REPORT

QC La	t: 4-15-91 M	fethod: EPA TO-14	- GC/MS Full Scan
	Compound	MDL ppbv	Blank (ppbv)
	Vinyl Chloride Acetonitrile 1.1-Dichloroethene Dichloromethane 1.1-Dichloroethane Chloroform 1,1,1-Trichloroeth 1,2-Dichloroethane Benzene Carbon Tetrachlori Trichloroethene Toluene 1,2-Dibromoethane Tetrachloroethene Chlorobenzene Xylenes Dichlorobenzenes Benzyl Chloride	0.50 0.50 0.50 name 0.50 0.50	not detec



METHOD BLANK REPORT

•	4-15-91 Me		GC/MS Full Scan
•••••	Compound	MDL ppbv	Blank (ppbv)
	Vinyl Chloride Acetonitrile 1.1-Dichloroethene Dichloromethane 1.1-Dichloroethane Chloroform 1.1.1-Trichloroethane 1.2-Dichloroethane Benzene Carbon Tetrachlorid Trichloroethene Toluene 1.2-Dibromoethane Tetrachloroethene Chlorobenzene Xylenes Dichlorobenzenes	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec not detec
	Benzvl Chloride	0.50	not detec



Sample: 10567 Duplote: 10567 D QC Lot: 4-15-91

QC Lot: 4-13-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv			Duplicate ppbv		QC Limits
Vinyl Chloride		detec	not	detec	• • • • • • •	40
Acetonitrile	not	detec	not	detec		40
l.l-Dichloroethene	not	detec	not	detec		40
Dichloromethane	2.6		4.0		43	40
l,l-Dichloroethane	not	detec	not	detec		40
Chloroform	not	detec	not	detec		40
l.l.l-Trichloroethane	3.4		3.5		3	40
L.2-Dichloroethane	not	detec	not	detec		40
Benzene	1.8		1.8		2	40
Carbon Tetrachloride	not	detec	not	detec	_	40
richloroethene	not	detec	not	detec		40
Coluene	3.2		3.3		5	40
.,2-Dibromoethane	not	detec	not	detec	-	40
Tetrachloroethene	not	detec	not	detec		40
Chlorobenzene	not	detec	not	detec		40
Ylenes	1.9		1.9		1	40
Dichlorobenzenes	not	detec		detec	-	40
Benzyl Chloride	not	detec		detec		40



Sample: 10567 Duplote: 10567 D

QC Lot: 4-15-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		•	
Vinyl Chloride	not detec	not detec		40	
Acetonitrile	not detec	not detec		40	
l.l-Dichloroethene	not detec	not detec		40	
Dichloromethane	2.6	4.0	43	40	
l.l-Dichloroethane	not detec	not detec		40	
Chloroform	not detec	not detec		40	
l,l,l-Trichloroethane	3.4	3.5	3	40	
2-Dichloroethane	not detec	not detec		40	
Benzene	1.8	1.8	2	40	
arbon Tetrachloride	not detec	not detec		40	
[richloroethene	not detec	not detec		40	
Coluene	3.2	3.3	5	40	
1.2-Dibromoethane	not detec	not detec		40	
[etrachloroethene	not detec	not detec		40	
Chlorobenzene	not detec	not detec		40	
(ylenes	1.9	1.9	1	40	
)ichlorobenzenes	not detec	not detec		40	
Benzvl Chloride	not detec	not detec		40	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-B-0-39-3 Can #: Bag Lab #: 10589
Date Sampled: 4-11-91
Date Analyzed: 4-15-91

Can #: Bag		Date Anal	Lyzed: 4-15-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1.1-Dichloroethene	3.00	not detected	not detected
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	18	140
1.1-Dichloroethane	3.00	not detected	not detected
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1.2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1,1,1-Trichloroethane	3.00	25	140
1,2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	6.7	36
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Compound	MDL	Concentration	Concentration	
	ppbv	ppbv	ug/m3	
Freon 12	0.75	not detected	not detected	
Vinyl Chloride	0.75	not detected	not detected	
Freon 11	0.75	not detected	not detected	
1,1-Dichloroethene	0.75	not detected	not detected	
Dichloromethane	0.75	10	35	
Trichlorotriflouroethane	0.75	not detected	not detected	
1,1-Dichloroethane	0.75	not detected	not detected	
c-1,2-Dichloroethene	0.75	not detected	not detected	
t-1,2-Dichloroethene	0.75	not detected	not detected	
Chloroform	0.75	not detected	not detected	
1,1,1-Trichloroethane	0.75	not detected	not detected	
1,2-Dichloroethane	0.75	not detected	not detected	
Benzene	0.75	not detected	not detected	
Carbon Tetrachloride	0.75	not detected	not detected	
Trichloroethene	0.75	not detected	not detected	
Toluene	0.75	not detected	not detected	
Tetrachloroethene	0.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

______ Lab #: 10600
Date Sampled: 4-11-91
Date Analyzed: 4-15-91 Client: CH2M Hill Site: VR-B-0-36-1 Can #: Bag

Can #: Bag		Date Analy	zed: 4-15-91
Compound	MDL ppbv	Concentration ppbv	ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	140	540
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	110	860
1.1-Dichloroethane	3.75	not detected	not detected
c-1.2-Dichloroethene	3.75	not detected	not detected
t-1.2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	67	360
1,2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	21	110
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10601

Site: VR-B-0-36-2 Can #: Bag Date Sampled: 4-11-91
Date Analyzed: 4-15-91

Can #. bag		Date Analy	yzed: 4-15-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
1,1-Dichloroethene	3.00	56	220
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	not detected	not detected
1.1-Dichloroethane	3.00	not detected	not detected
c-1,2-Dichloroethene	3.00	not detected	not detected
t-1.2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1.1,1-Trichloroethane	3.00	150	820
1,2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	41	220
Toluene	3.00	not detected	not detected
Tetrachloroethene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-B-0-36-3 Can #: Bag Lab #: 10602
Date Sampled: 4-11-91
Date Analyzed: 4-15-91

Can ⊕: Bag				yzed: 4-15-91
Compound	MDL ppbv	Con	centration ppbv	Concentration ug/m3
Freon 12	3.00		detected	not detected
Vinyl Chloride	3.00	not	detected	not detected
en 11	3.00	not	detected	not detected
l-Dichloroethene	3.00	170		680
Dichloromethane	3.00	not	detected	not detected
Trichlorotriflouroethane	3.00	150		1100
1.1-Dichloroethane	3.00	not	detected	not detected
c-1.2-Dichloroethene	3.00	not	detected	not detected
t-1.2-Dichloroethene	3.00	not	detected	not detected
Chloroform	3.00	not	detected	not detected
1.1.1-Trichloroethane	3.00	120		660
1,2-Dichloroethane	3.00	not	detected	not detected
Benzene	3.00	not	detected	not detected
Carbon Tetrachloride	3.00	not	detected	not detected
Trichloroethene	3.00	29		160
Toluene	3.00	not	detected	not detected
Tetrachloroethene	3.00	not	detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10603

 Site:
 VR-B-0-13-B
 Date Sampled:
 4-12-91

 Can #:
 Bag
 Date Analyzed:
 4-15-91

Can #: 5ag		•	yzed: 4-13-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1,1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	11	39
Trichlorotriflouroethane	0.75	not detected	not detected
1,1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
l,l,l-Trichloroethane	0.75	5.1	28
1,2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	1.8	6.9
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client: CH2M Hill
 Lab #: 10604

 Site: VR-B-0-13-1
 Date Sampled: 4-12-91

 Can #: Bag
 Date Analyzed: 4-15-91

••••••	• • • • • • • • • • • • • • • • • • • •	c	• • • • • • • • • • • • • • • • • • • •
Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Fee: 13	3 00		
Freon 12	3.00	not detected	not detected
Vinyl Chloride	3.00	not detected	not detected
Freon 11	3.00	not detected	not detected
l-Dichloroethene	3.00	not detected	not detected
Dichloromethane	3.00	not detected	not detected
Trichlorotriflouroethane	3.00	190	1400
1.1-Dichloroethane	3.00	not detected	not detected
c-1.2-Dichloroethene	3.00	not detected	not detected
t-1,2-Dichloroethene	3.00	not detected	not detected
Chloroform	3.00	not detected	not detected
1.1.1-Trichloroethane	3.00	not detected	not detected
1.2-Dichloroethane	3.00	not detected	not detected
Benzene	3.00	not detected	not detected
Carbon Tetrachloride	3.00	not detected	not detected
Trichloroethene	3.00	not detected	not detected
Toluene	3.00	not detected	not detected
Tetrachlor othene	3.00	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10605
Date Sampled: 4-12-91
Date Analyzed: 4-15-91 Site: VR-B-0-13-2 Can #: Bag

Call 7. Dag		and independent of the contract of the contrac		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	3.75	not detected	not detected	
Vinyl Chloride	3.75	not detected	not detected	
Freon 11	3.75	not detected	not detected	
1.1-Dichloroethene	3.75	not detected	not detected	
Dichloromethane	3.75	32	110	
Trichlorotriflouroethane	3.75	130	980	
1,1-Dichloroethane	3.75	not detected	not detected	
c-1,2-Dichloroethene	3.75	not detected	not detected	
t-1,2-Dichloroethene	3.75	not detected	not detected	
Chloroform	3.75	not detected	not detected	
1.1.1-Trichloroethane	3.75	not detected	not detected	
1,2-Dichloroethane	3.75	not detected	not detected	
Benzene	3.75	not detected	not detected	
Carbon Tetrachloride	3.75	not detected	not detected	
Trichloroethene	3.75	not detected	not detected	
Toluene	3.75	not detected	not detected	
Tetrachloroethene	3.75	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: 0	CH2M Hill	Lab #:	10606
Site: \	7R-B-0-13-3	Date Sampled:	4-12-91
Can #: 8	Bag	Date Analyzed:	4-15-91

Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1.1-Dichloroethene	3.75	not detected	not detected
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	190	1400
l.l-Dichloroethane	3.75 .	not detected	not detected
:-1,2-Dichloroethene	3.75	not detected	not detected
:-1.2-Dichloroethene	3.75	not detected	not detected
Chioroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	not detected	not detected
L.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichioroethene	3.75	not detected	not detected
Coluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected

ANALYTICAL RESULTS April 16, 1991



METHOD BLANK REPORT

QC Lot: 4-16-9	Method:		- GC/MS Full Scan
Compour		MDL ppbv	Blank (ppbv)
Freon 1.1-Did Dichlor Trichlo 1.1-Did c-1,2-I t-1.2-I Chlorof 1.1.1-I 1.2-Did Benzene Carbon Trichlo Toluene	Chloride Chloroethene comethane Chloroethane Chloroethene Cichloroethene Crichloroethane Chloroethane Chloroethane Chloroethane Chloroethane Chloroethane	0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10347 Duplote: 10347 D

QC Lot: 4-16-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC Limits
Freon 12	not detec	not detec	• • • • • • •	40
Vinyl Chloride	28	36	25	40
Freon 11	110	71	43	40
1.1-Dichloroethene	9900	8100	20	40
Dichloromethane	16	19	17	40
Trichlorotrifluoroethane	5900	5000	17	40
1.1-Dichloroethane	42	40	5	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1.1.1-Trichloroethane	80	68	16	40
1,2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	370	310	18	40
Toluene	not detec	not detec		40
Tetrachloroethane	11	9.9	11	40



METHOD BLANK REPORT

QC Lot: 4-16-91 Method:		GC/MS Full Scan
Compound	MDL ppbv	Blank (ppbv)
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoroethane	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 13347 Duplcte: 10347 D

QC Lot: 4-16-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv	RPD	Limits	
Freon 12	not detec	not detec		40	
Vinvi Chloride	28	36	25	40	
Freon 11	110	71	43	40	
1.1-Dichloroethene	9900	8100	20	40	
Dichloromethane	16	19	17	40	
Trichlorotrifluoroethane	5900	5000	17	40	
l.l-Dichloroethane	42	40	5	40	
c-l,2-Dichloroethene	not detec	not detec		40	
t-1.2-Dichlorcethene	not detec	not detec		40	
Chloroform	not detec	not detec		40	
l,l,l-Trichloroethane	80	68	16	40	
1.2-Dichloroethane	not detec	not detec		40	
Benzene	not detec	not detec		40	
Carbon Tetrachloride	not detec	not detec		40	
Trichloroethene	370	310	18	40	
Toluene	not datec	not detec		40	
Tetrachloroethane	11	9.9	11	40	



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 10347 Duplote: 10347 D

QC Lot: 4-16-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv		QC · Limits
Freon 12	not detec	not detec		40
Vinvl Chloride	28	36	25	40
Freon 11	110	71	43	40
1.1-Dichloroethene	9900	8100	20	40
Dichloromethane	16	19	17	40
Trichlorotrifluoroethane	5900	5000	17	40
1.1-Dichloroethane	42	40	5	40
c-1,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	not detec	not detec		40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	80	68	16	40
1.2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	not detec	not detec		40
Trichloroethene	370	310	18	40
Toluene	not detec	not detec		40
Tetrachloroethane	11	9.9	11	40



METHOD BLANK REPORT

QC Lot: 4-16-91	Method:		GC/MS Full Scan
Compound		MDL ppbv	Blank (ppbv)
Freon 12 Vinyl Chloride Freon 11 1,1-Dichloroes Dichloromethar Trichlorotrifl 1,1-Dichloroes c-1,2-Dichloroes c-1,2-Dichloro t-1,2-Dichloro Chloroform 1,1,1-Trichlos 1,2-Dichloroes Benzene Carbon Tetrack	thene tuoroethane thane bethene bethene coethane	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detec
Trichloroether Toluene Tetrachloroetl		0.50 0.50 0.50	not detec not detec not detec



EPA Method TO-14: GC/MS Full Scan

Lab #: 10347
Date Sampled: 4-3-91
Date Analyzed: 4-16-91 Client: CH2M Hill Site: MW-AC-0-8-1 Can #: 22

Can #: 22			yzed: 4-16-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	28	72
Freon 11	1.50	110	640
1,1-Dichloroethene	1.50	9900	39000
Dichloromethane	1.50	16	57
Trichlorotriflouroethane	1.50	5900	45000
1,1-Dichloroethane	1.50	42	170
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1.2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	80	440
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	370	2000
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	11	75



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: MW-AC-0-9-1 Can #: 22 Lab #: 10347 D

Date Sampled: 4-6-91 Date Analyzed: 4-16-91 4-16-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freen 12	1.50	not detected	not detected
Vinyl Chloride	1.50	36	91
Freon 11	1.50	71	400
1.1-Dichloroethene	1.50	8100	32000
Dichloromethane	1.50	19	67
Trichlorotriflouroethane	1.50	5000	37000
1.1-Dichloroethane	1.50	40	160
c-1.2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	68	370
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Terrachloride	1.50	not detected	not detected
Trichloroethene	1.50	310	1600
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	9.9	67



EPA Method TO-14: GC/MS Full Scan

Can #: 108			zed: 4-16-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	5.00	not detected	not detected
Vinyl Chloride	5.00	not detected	not detected
Freon 11	5.00	260	1500
1,1-Dichloroethene	5.00	27000	110000
'ichloromethane	5.00	39	130
frichlorotriflouroethane	5.00	16000	130000
1.1-Dichloroethane	5.00	140	550
c-1.2-Dichloroethene	5.00	not detected	not detected
t-1,2-Dichloroethene	5.00	not detected	not detected
Chloroform	5.00	not detected	not detected
1,1,1-Trichloroethane	5.00	240	1300
1.2-Dichloroethane	5.00	not detected	not detected
Benzene	5.00	not detected	not detected
Carbon Tetrachloride	5.00	not detected	not detected
Trichloroethene	5.00	1100	6100 [°]
Toluene	5.00	not detected	not detected
Tetrachloroethene	5.00	32	210



EPA Method TO-14: GC/MS Full Scan

Lab #: 10394
Date Sampled: 4-6-91 Client: CH2M Hill Site: MW-AC-0-6-1

Can #: 103		•	yzed: 4-16-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1,1-Dichloroethene	0.75	490	2000
Dichloromethane	0.75	7.8	27
Trichlorotriflouroethane	0.75	440	3400
1.1-Dichloroethane	0.75	not detected	not detected
c-1.2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
3enzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	20	110
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10397
Date Sampled: 4-6-91
Date Analyzed: 4-16-91 Site: MW-AC-0-6-4 Can #: 77

			,
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
l, l-Dichloroethene	1.50	24	94
Dichloromethane	1.50	4.6	16
Trichlorotriflouroethane	1.50	540	4100
1.1-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	not detected	not detected
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	75	400
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2# Hill Site: MW-AC-0-5-B Can #: 92 Lab #: 10407
Date Sampled: 4-12-91
Date Analyzed: 4-16-91

			,
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.75	not detected	not detected
1.1-Dichloroethene	0.75	not detected	not detected
Dichloromethane	0.75	13	44
Trichlorotriflouroethane	0.75	not detected	not detected
1.1-Dichloroethane	0.75	not detected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1.2-Dichloroethene	0.75	not detected	not detected
Chloroform	0.75	not detected	not detected
1.1.1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	not detected	not detected
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10408

 Site:
 MW-AC-0-5-1
 Date Sampled:
 4-8-91

 Can #:
 89
 Date Analyzed:
 4-16-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
••••••	• •		
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1,1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	11	38
Trichlorotriflouroethane	1.50	not detected	not detected
1 l-Dichloroethane	1.50	not detected	not detected
i,2-Dichloroethene	1.50	not detected	not detected
1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	not detected	not detected
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 10410

 Site:
 MW-AC-0-5-3
 Date Sampled:
 4-8-91

 Can #:
 83
 Date Analyzed:
 4-16-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3		
Freon 12	1.50	not detected	not detected		
Vinyl Chloride	1.50	not detected	not detected		
Freon 11	1.50	not detected	not detected		
1,1-Dichloroethene	1.50	not detected	not detected		
Dichloromethane	1.50	not detected	not detected		
Trichlorotriflouroethane	1.50	not detected	not detected		
1,1-Dichloroethane	1.50	not detected	not detected		
c-1,2-Dichloroethene	1.50	not detected	not detected		
t-1,2-Dichloroethene	1.50	not detected	not detected		
Chloroform	1.50	not detected	not detected		
1,1,1-Trichloroethane	1.50	not detected	not detected		
1,2-Dichloroethane	1.50	not detected	not detected		
Benzene	1.50	not detected	not detected		
Carbon Tetrachloride	1.50	not detected	not detected		
Trichloroethene	1.50	not detected	not detected		
Toluene	1.50	not detected	not detected		
Tetrachloroethene	1.50	not detected	not detected		



EPA Method TO-14: GC/MS Full Scan

Lab #: 10411
Date Sampled: 4-8-91
Date Analyzed: 4-16-91 Client: CH2M Hill Site: MW-AC-0-4-B Can #: 27

Can #: 27			Date Anal	yzed: 4-16-91
Compound	MDL ppbv	Con	centration ppbv	Concentration ug/m3
Freon 12	0.75		detected	not detected
Vinyl Chloride	0.75	not	detected	not detected
Freon 11	0.75	not	detected	not detected
1.1-Dichloroethene	0.75	not	detected	not detected
Dichloromethane	0.75	7.6		26
Trichlorotriflouroethane	0.75	not	detected	not detected
1.1-Dichloroethane	0.75	not	detected	not detected
c-1 2-Dichloroethene	0.75	not	detected	not detected
t-1.2-Dichloroethene	0.75	not	detected	not detected
Chloroform	0.75	not	detected	not detected
1,1,1-Trichloroethane	0.75	not	detected	not detected
1.2-Dichloroethane	0.75	not	detected	not detected
Benzene	0.75	not	detected	not detected
Carbon Tetrachloride	0.75	not	detected	not detected
Trichloroethene	0.75	not	detected	not detected
Toluene	0.75	7.8		29
Tetrachloroethene	0.75		detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10412
Date Sampled: 4-8-91
Date Analyzed: 4-16-91 Site: MW-AC-0-4-1 Can #: 122

Compound	:IDL	Concentration	Concentration	
	ppbv	ppbv	ug∕m3	
Freon 12	2.00	not detected	not detected	
Vinyl Chloride	2.00	not detected	not detected	
Freon 11	2.00	not detected	not detected	
l.1-Dichloroethene	2.00	not detected	not detected	
Dichloromethane	2.00	not detected	not detected	
Trichlorotriflouroethane	2.00	not detected	not detected	
1.1-Dichloroethane	2.00	not detected	not detected	
c-1.2-Dichloroethene	2.00	not detected	not detected	
t-1,2-Dichloroethene	2.00	not detected	not detected	
Chloroform	2.00	not detected	not detected	
1,1,1-Trichloroethane	2.00	not detected	not detected	
1,2-Dichloroethane	2.00	not detected	not detected	
Benzene	2.00	not detected	not detected	
Carbon Tetrachloride	2.00	not detected	not detected	
Trichloroethene	2.00	6.3	34	
Toluene	2.00	not detected	not detected	
Tetrachloroethene	2.00	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 10413

Site: MW-AC-0-4-2 Can #: 131			: 4-8-91 d: 4-16-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotriflouroethane 1.1-Dichloroethane c-1,2-Dichloroethene t-1.2-Dichloroethene Chloroform 1.1.1-Trichloroethane	1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50	not detected not detected 120 not detected 400 not detected not detected 43 not detected not detected	not detected not detected 480 not detected 3100 not detected not detected 170 not detected not detected not detected not detected not detected not detected
1.2-Dichloroethane Benzene Carbon Tetrachloride Trichloroethene Toluene Tetrachloroethene	1.50 1.50 1.50 1.50 1.50	not detected not detected not detected 720 not detected not detected	not detected not detected not detected 3800 not detected not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 10414
Date Sampled: 4-8-91
Date Analyzed: 4-16-91 Site: MW-AC-0-4-3 Can #: 94

Can y. Ja		Jaco Allas	y 200
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	0.75	not detected	not detected
Vinyl Chloride	0.75	not detected	not detected
Freon 11	0.7 5	not detected	not detected
1,1-Dichloroethene	0.75	33	130
Dichloromethane	0.75	not detected	not detected
Trichlorotriflouroethane	0.75	210	1700
1,1-Dichloroethane	0.75	not delected	not detected
c-1,2-Dichloroethene	0.75	not detected	not detected
t-1,2-Dichloroethene	0.75	28	110
Chloroform	0.75	not detected	not detected
1,1,1-Trichloroethane	0.75	not detected	not detected
1.2-Dichloroethane	0.75	not detected	not detected
Benzene	0.75	not detected	not detected
Carbon Tetrachloride	0.75	not detected	not detected
Trichloroethene	0.75	520	2800
Toluene	0.75	not detected	not detected
Tetrachloroethene	0.75	not detected	not detected

ANALYTICAL RESULTS April 17, 1991



Client: CH2M Hill		Lab #:	10448
Site: VR-V-0-43		Date Sampled:	
/ial #: 43		Date Analyzed:	
Compound	MDL	Concentration	• • • • • • • • •
	ug/L	ug/L	
reon 12	50	not detected	
inyl Chloride	10	not detected	
reon 11	10	not detected	
,1-Dichloroethene	10	not detected	
ichloromethane	· 10	not detected	
richlorotriflouroethane	TO.	not detected	
,l-Dichloroethane	10	not detected	
-1,2-Dichloroethene	10	not detected	
-1,2-Dichloroethene	10	not detected	
hloroform	10	not detected	
.l.l-Trichloroethane	10	not detected	
,2-Dichloroethane	10	not detected	
enzene	10	not detected	
arbon Tetrachloride	10	not detected	
richloroethene	10	not detected	
oluene	10	not detected	
etrachloroethene	10	not detected	



Client: CH2M Hill		Lab #:	10449
Site: VR-V-0-44		Date Sampled:	
Vial #: 44		Date Analyzed:	
• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	
Compound	MDL	Concentration	
	ug/L	ug/L	
Freon 12	50	not detected	• • • • • • • • •
/inyl Chloride	10	not detected	
Freon 11	10	not detected	•
l,1-Dichloroethene	10	not detected	
Dichloromethane	. 10	not detected	
[richlorotriflouroethane	10	not detected	
1,1-Dichloroethane	10	not detected	
-1,2-Dichloroethene	10	not detected	
t-1,2-Dichloroethene	10	not detected	
Chloroform	10	not detected	
l,l,l-Trichloroethane	10	not detected	
1,2-Dichloroethane	10	not detected	
Benzene	10	not detected	
Carbon Tetrachloride	10	not detected	
Crichloroethene	10	not detected	
Toluene	10	not detected	
Tetrachloroethene	10	not detected	



EPA	Method	8240:	GC/MS	rull	Scan

Client:	CH2M Hill	Lab #:	10565
Site:	VR-V-0-61	Date Sampled:	4-10-91
Vial #:	61	Date Analyzed:	4-17-91
			• • • • • • • • • • • • •

MDL ug/L	Concentration ug/L	
250	nor detected	
50	not detected	
50	not detected	
50	not detected	
• 50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
50	not detected	
	MDL ug/L 250 50 50 50 50 50 50 50 50 50 50 50	



EPA Method 8240: GC/MS Ful	l Scan		
Client: CH2M Hill Site: VR-V-0-34 Vial #: 34		Lab #: Date Sampled: Date Analyzed:	4-10-91
Compound	MDL ug/L	Concentration ug/L	
Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotriflouroethane 1,1-Dichloroethane c-1.2-Dichloroethene t-1,2-Dichloroethene Chloroform 1,1,1-Trichloroethane 1,2-Dichloroethane Benzene Carbon Tetrachloride	250 50 50 50 50 50 50 50 50 50 50	not detected	
Trichloroethene Toluene Tetrachloroethene	50 50 50	not detected not detected not detected	

ANALYTICAL RESULTS April 18, 1991



METHUD BLANK REPORT

QC Lot:	4-18-91 Meth	od: EPA TO-14 - 0	GC/MS Full Scan
	Compound	MDT.	Blank (ppbv)
	Freon 12 Vinyl Chloride Freon 11 1.1-Dichloroethene Dichloromethane Trichlorotrifluoroeth 1.1-Dichloroethane c-1.2-Dichloroethene t-1.2-Dichloroethene Chloroform 1.1.1-Trichloroethane Benzene Carbon Tetrachloride Trichloroethene	0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50	not detect
	Toluene Tetrachloroethane	0.50 0.50	not detec not detec



DUPLICATE SAMPLE/SPIKE RESULTS

Sample: 3142 Duplote: 3142D

QC Lot: 4-18-91 Method: EPA TO-14 - GC/MS Full Scan

Compound	Sample ppbv	Duplicate ppbv	z RPD	QC Limits
Freon 12	72	66	9	40
Vinyl Chloride	not detec	not detec		40
Freon 11	84	70	18	40
1,1-Dichloroethene	320	260	21	40
Dichloromethane	7.4	12	47	40
Trichlorotrifluoroethane	13000	12000	8	40
1,1-Dichloroethane	not detec	not detec		40
c-l,2-Dichloroethene	not detec	not detec		40
t-1,2-Dichloroethene	5.9	5.8	2	40
Chloroform	not detec	not detec		40
1,1,1-Trichloroethane	not detec	not detec		40
1,2-Dichloroethane	not detec	not detec		40
Benzene	not detec	not detec		40
Carbon Tetrachloride	19	15	24	40
Trichloroethene	37	29	24	40
Toluene	not detec	not detec		40
Tetrachloroethane	not detec	not detec		40



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 3121

 Site:
 CR-AC-C-36-B
 Date Sampled:
 4-11-91

 Can #:
 P146
 P146
 Date Analyzed:
 4-18-91

Compound	MDL	Concentration	Concentration	
	ppbv	ppbv	ug/m3	
Freon 12	0.60	not detected	not detected	
Vinyl Chloride	0.60	not detected	not detected	
Freon 11	0.60	not detected	not detected	
1.1-Dichloroethene	0.60	not detected	not detected	
Dichloromethane	0.60	2.6	8.9	
"richlorotriflouroethane	0.60	not detected	not detected	
l-Dichloroethane	0.60	not detected	not detected	
c-1,2-Dichloroethene	0.60	not detected	not detected	
t-1,2-Dichloroethene	0.60	not detected	not detected	
Chloroform	0. 60	not detected	not detected	
l.l.l-Trichloroethane	0.60	not detected	not detected	
1.2-Dichloroethane	0.60	not detected	not detected	
3enzene	0.60	not detected	not detected	
Carbon Tetrachloride	0.60	not detected	not detected	
Trichloroethene	0.60	not detected	not detected	
Toluene	0.60	not detected	not detected	
Tetrachloroethene	0.60	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill

Lab #: 3130
Date Sampled: 4-12-91
Date Analyzed: 4-18-91 Site: VR-AC-C-13-2 Can #: P135

Call 7. 1155		Jaco maly 200. 4-10-71		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	1.50	not detected	not detected	
Vinyl Chloride	1.50	not detected	not detected	
Freon 11	1.50	not detected	not detected	
1,1-Dichloroethene	1.50	not detected	not detected	
Dichloromethane	1.50	3.0	10	
Trichlorotriflouroethane	1.50	130	980	
1.1-Dichloroethane	1.50	not detected	not detected	
c-1,2-Dichloroethene	1.50	not detected	not detected	
t-1.2-Dichloroethene	1.50	not detected	not detected	
Chloroform	1.50	not detected	not detected	
1.1.1-Trichloroethane	1.50	not detected	not detected	
1.2-Dichloroethane	1.50	not detected	not detected	
Benzene	1.50	not detected	not detected	
Carbon Tetrachloride	1.50	not detected	not detected	
Trichloroethene	1.50	not detected	not detected	
Toluene	1.50	not detected	not detected	
Tetrachloroethene	1.50	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

 Client: CH2M Hill
 Lab #: 3138

 Site: MW-LFAC-C-2-2
 Date Sampled: 4-12-91

 Can #: P133
 Date Analyzed: 4-18-91

		3233 1212 y 334 72		
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
Freon 12	2.50	37	180	
Vinyl Chloride	2.50	not detected	not detected	
Freon 11	2.50	42	240	
l.1-Dichloroethene	2.50	160	640	
Dichloromethane	2.50	10	35	
Trichlorotriflouroethane	2.50	8200	63000	
l,1-Dichloroethane	2.50	not detected	not detected	
c-1,2-Dichloroethene	2.50	not detected	not detected	
t-1.2-Dichloroethene	2.50	4.1	16	
Thioroform	2.50	not detected	not detected	
l.1.1-Trichloroethane	2.50	not detected	not detected	
l.2-Dichloroethane	2.50	not detected	not detected	
3enzene	2.50	not detected	not detected	
Carbon Tetrachloride	2.50	9.1	58	
Trichloroethene	2.50	21	110	
Toluene	2.50	not detected	not detected	
Tetrachloroethene	2.50	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Lab #: 3140
Site: VR-AC-C-13-4 Date Sampled: 4-12-91
Can #: P148 Date Analyzed: 4-18-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1,1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	not detected	not detected
Trichlorotriflouroethane	1.50	74	570
l.l-Dichloroethane	1.50	not detected	not detected
c-1,2-Dichloroethene	1.50	not detected	not detected
t-1.2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	not detected	not detected
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



IPA Method TO-14: GC/MS Full Scan

Lab #: 3141
Date Sampled: 4-12-91
Date Analyzed: 4-18-91 Dlient: CH2M Hill Bite: MW-LFAC-C-2-3 Dan #: P130

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3	
reon 12	1.50	68	340	
inyl Chloride	1.50	not detected	not detected	
reon 11	1.50	82	460	
.,l-Dichloroethene	1.50	310	1200	
chloromethane	1.50	8.3	29	
ichlorotriflouroethane	1.50	13000	100000	
l-Dichloroethane	1.50	not detected	not detected	
:-1,2-Dichloroethene	1.50	not detected	not detected	
-1.2-Dichloroethene	1.50	6.5	26	
hloroform	1.50	not detected	not detected	
.l.l-Trichloroethane	1.50	not detected	not detected	
2-Dichloroethane	1.50	not detected	not detected	
enzene	1.50	not detected	not detected	
arbon Tetrachloride	1.50	19	120	
richloroethene	1.50	39	210	
'oluene	1.50	not detected	not detected	
etrachloroethene	1.50	not detected	not detected	



EPA Method TO-14: GC/MS Full Scan

 Client.
 CH2M Hill
 Lab #:
 3142

 Site:
 MW-LFAC-C-2-4
 Date Sampled:
 4-12-91

 Can #:
 P138
 Date Analyzed:
 4-18-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	72	360
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	84	470
1.1-Dichloroethene	1.50	320	1300
Dichloromethane	1.50	7.4	25
Trichlorotriflouroethane	1.50	13000	100000
1.1-Dichloroethane	1.50	not detected	not detected
c-1.2-Dichloroethene	1.50	not detected	not detected
t-1.2-Dichloroethene	1.50	5.9	24
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	not detected	not detected
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	19	120
Trichloroethene	1.50	37	200
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not letected



EPA Method TO-14: GG/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 3142 D

 Site:
 MW-LFAC-C-2-4
 Date Sampled:
 4-12-91

 Can #:
 P138
 Date Analyzed:
 4-18-91

Can #: P138			yzed: 4-18-91
Compound	MDL ppbv	Concentration ppbv	ug/m3
Freon 12	1.67	66	330
Vinyl Chloride	1.67	not detected	not detected
Freon 11	1.67	70	400
1,1-Dichloroethene	1.67	260	10 00
Dichloromethane	1.67	12	43
Crichlorotriflouroethane	1.67	12000	95000
1.1-Dichloroethane	1.67	not detected	not detected
c-1,2-Dichloroethene	1.67	not detected	not detected
t-1.2-Dichloroethene	1.67	5.8	23
Chloroform	1.67	not detected	not detected
1.1.1-Trichloroethane	1.67	not detected	not detected
1.2-Dichloroethane	1.67	not detected	not detected
Benzene	1.67	not detected	not detected
Carbon Tetrachloride	1.67	15	93
Trichloroethene	1.67	29	160.
Toluene	1.67	not detected	not detected
Tetrachloroethene	1.67	not detected	not detected



EPA Method TO-14: GC/MS Full Scan Client: CH2M Hill

Lab #: 3125
Date Sampled: 4-11-91
Date Analyzed: 4-18-91 Site: VR-PC-C-36-4 Can #: P119

Compound	MDL	Concentration	Concentration
	ppbv	ppbv	ug/m3
Freon 12	3.75	not detected	not detected
Vinyl Chloride	3.75	not detected	not detected
Freon 11	3.75	not detected	not detected
1,1-Dichloroethene	3.75	240	930
Dichloromethane	3.75	not detected	not detected
Trichlorotriflouroethane	3.75	200	1600
1.1-Dichloroethane	3.75	not detected	not detected
c-1.2-Dichloroethene	3.75	not detected	not detected
t-1.2-Dichloroethene	3.75	not detected	not detected
Chloroform	3.75	not detected	not detected
l.l.l-Trichloroethane	3.75	180	960
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	not detected	not detected
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	20	100
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client: CH2M Hill Site: VR-AC-C-13-3 Lab #: Date Sampled: 4-12-91

Can #: P149		Date Analy	rzed: 4-18-91
Compound	HDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1.1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	not detected	not detected
Trichlorotriflourcethane	1.50	77	590
1,1-Dichloroethane	1.50	not detected	not detected
c-1.2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	not detected	not detected
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	not appented	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Site: AA-AC-C-1 Date Sampled: 4-12-91
Can #: P143 Date Analyzed: 4-18-91

Can #: P143		Date Analy	yzed: 4-18-91
Compound	MDL ppbv	Concentration ppbv	ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
l.l-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	not detected	not detected
Trichlorotriflouroethane	1.50	not detected	not detected
1,1-Dichloroethane	1.50	not detected	not detected
c-1.2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1,1,1-Trichloroethane	1.50	not detected	not detected
1.2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Client:	CH2M Hill	Lab #:	3134
Site:	AA-AC-C-1	Date Sampled:	4-12-91
Can ∲:	P144	Date Analyzed:	4-18-91

Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3		
Freon 12	1.50	not detected	not detected		
Vinyl Chloride	1.50	not detected	not detected		
Freon 11	1.50	not detected	not detected		
1.1-Dichloroethene	1.50	2.6	10		
Dichloromethane	1.50	4.3	15		
Trichlorotriflouroethane	1.50	not detected	not detected		
1,1-Dichloroethane	1.50	not detected	not detected		
c-1,2-Dichloroethene	1.50	not detected	not detected		
t-1,2-Dichloroethene	1.50	not detected	not detected		
Chloroform	1.50	not detected	not detected		
1.1.1-Trichloroethane	1.50	not detected	not detected		
1.2-Dichloroethane	1.50	not detected	not detected		
Benzene	1.50	not detected	not detected		
Carbon Tetrachloride	1.50	not detected	not detected		
Trichloroethene	1.50	not detected	not detected		
Toluene	1.50	not detected	not detected		
Tetrachloroethene	1.50	not detected	not detected		



EPA Method TO-14: GC/MS Full Scan

Lab #: 3135
Date Sampled: 4-12-91
Date Analyzed: 4-18-91 Client: CH2M Hill Site: MW-LFAC-C-7-1 Can #: P129

	Date Anal	yzed. 4-16-91
MDL ppbv	Concentration ppbv	Concentration ug/m3
3.75	not detected	not detected
3.75	310	800
3.75	98	550
3.75	20000	80000
3.75	15	52
3.75	11000	85000
3.7 5	1400	5500
3.75	17	69
3.75	650	2600
3.75	5.1	25
3.75	51	280
3.75	not detected	not detected
3.75	30	97
3.75	not detected	not detected
3.75	920	5000
3.75	not detected	not detected
3.75	15	100
	3.75 3.75 3.75 3.75 3.75 3.75 3.75 3.75	MDL ppbv ppbv 3.75 not detected 3.75 310 3.75 98 3.75 20000 3.75 15 3.75 11000 3.75 1400 3.75 17 3.75 650 3.75 5.1 3.75 5.1 3.75 5.1 3.75 not detected 3.75 30 3.75 not detected 3.75 920 3.75 not detected



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 3136

 Site:
 MW-LFAC-C-7-2
 Date Sampled:
 4-12-91

 Can #:
 P132
 Date Analyzed:
 4-18-91

Compound	MDL Ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	3.75	not detected	not detected
Vinvl Chloride	3.75	360	920
Freon 11	3.75	190	1100
1,1-Dichloroethene	3.75	55000	220000
chloromethane	3.75	91	320
ichlorotriflouroethane	3.75	270ÚO	210000
1.1-Dichloroethane	3.75	2700	11000
c-1,2-Dichloroethene	3.75	not detected	not detected
t-1,2-Dichloroethene	3.75	1300	4300
Chloroform	3.75	not detected	not detected
1.1.1-Trichloroethane	3.75	73	400
1.2-Dichloroethane	3.75	not detected	not detected
Benzene	3.75	57	180
Carbon Tetrachloride	3.75	not detected	not detected
Trichloroethene	3.75	1900	10000
Toluene	3.75	not detected	not detected
Tetrachloroethene	3.75	32	220



EPA Method TO-14: GC/MS Full Scan

 Client:
 CH2M Hill
 Lab #:
 3137

 Site:
 MW-LFAC-C-2-1
 Date Sampled:
 4-12-91

 Can #:
 P134
 Date Analyzed:
 4-18-91

Can #: P134		Date Analy	yzed: 4-16-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	2.14	57	280
Vinyl Chloride	2.14	not detected	not detected
Freon 11	2.14	78	440
1,1-Dichloroethene	2.14	300	1200
Dichloromethane	2.14	14	48
Trichlorotriflouroethane	2.14	14000	110000
1.1-Dichloroethane	2.14	not detected	not detected
c-1,2-Dichloroethene	2.14	not detected	not detected
t-1.2-Dichloroethene	2.14	6.6	26
Chloroform	2.14	not detected	not detected
1.1.1-Trichloroethane	2.14	not detected	not detected
1.2-Dichloroethane	2.14	not detected	not detected
Benzene	2.14	not detected	not detected
Carbon Tetrachloride	2.14	16	100
Trichloroethene	2.14	35	190
Toluene	2.14	not detected	not detected
Tetrachloroethene	2.14	not detected	not detected



EPA Method TO-14: GC/MS Full Scan

Lab #: 3139
Date Sampled: 4-12-91
Date Analyzed: 4-18-91 Client: CH2M Hill Site: VR-AC-C-13-5 Can n: P139

Can #: P139		Date Analy	zed: 4-18-91
Compound	MDL ppbv	Concentration ppbv	Concentration ug/m3
Freon 12	1.50	not detected	not detected
Vinyl Chloride	1.50	not detected	not detected
Freon 11	1.50	not detected	not detected
1,1-Dichloroethene	1.50	not detected	not detected
Dichloromethane	1.50	2.2	7.6
Trichlorotriflouroethane	1.50	120	890
1.1-Dichloroethane	1.50	not detected	not detected
c-1.2-Dichloroethene	1.50	not detected	not detected
t-1,2-Dichloroethene	1.50	not detected	not detected
Chloroform	1.50	not detected	not detected
1.1.1-Trichloroethane	1.50	not detected	not detected
1,2-Dichloroethane	1.50	not detected	not detected
Benzene	1.50	not detected	not detected
Carbon Tetrachloride	1.50	not detected	not detected
Trichloroethene	1.50	not detected	not detected
Toluene	1.50	not detected	not detected
Tetrachloroethene	1.50	not detected	not detected

ANALYTICAL RESULTS April 19, 1991



Client: CH2M Hill Site: MW-BT-0-7-3 (1st) Tube #: 2024		Lab #: Date Sampled: Date Analyzed:	4-11-91
Compound	MDL ug	Concentration ug	
Freon 12	0.001	7.25	
	0.001	5.08	
Freon 11	0.001	0.007	
1,1-Dichloroethene	0.001	6.69	
	0.001	0.005	
[richlorotriflouroethane	0.001	not detected	
l.l-Dichloroethane	0.001	not detected	
-1,2-Dichloroethene	0.001	not detected	
	0.001	not detected	
	0.001	not detected	
l.l.l-Trichloroethane	0.001	not detected	
1,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.47	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	2.24	
	0.001	0.008	
Tetrachloroethene	0.001	0.127	



EPA Method TO-02: GC/MS Full Scan	EPA	Method	TO-02:	GC/MS	Full	Scan
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Client: CH2M Hill		Lab #:	10592
Site: MW-BT-0-7-3 (2nd)		Date Sampled:	
Tube #: 2022	••••••	• • • • • • • • • • • • • • • • • • • •	
Compound	MDL	Concentration	
• • • • • • • • • • • • • • • • • • • •	ug	u g	
Freon 12	0.001	1.68	
Vinvl Chloride	0.001	4.54	
Freon 11	0.001	0.322	
l,l-Dichloroethene	0.001	11.3	
Dichloromethane	0.001	0.025	
Trichlorotriflouroethane	0.001	2.19	
l.l-Dichloroethane	0.001	0.111	
:-1,2-Dichloroethene	0.001	not detected	
1-1,2-Dichloroethene	0.001	0.12	
Chloroform	0.001	not detected	
l.l.l-Trichloroethane	0.001	0.006	
l.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.004	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.004	
Toluene	0.001	0.087	
Tetrachloroethene	0.001	not detected	



EPA Method TO-02: GC/MS Fu			
Client: CH2M Hill Site: MW-BT-0-7-4 (lst) Tube #: 2023		Lab #: Date Sampled: Date Analyzed:	10593 4-11-91
Compound	MDL ug	Concentration ug	· · · · · · · · · · · · · · · · · · ·
Freon 12	0.001 0.001	0.047 3.98	
Freon 11 1,1-Dichloroethene	0.001	0.038 21.6	
Dichloromethane Trichlorotriflouroethane	0.001	not detected 10.9	
1.1-Dichloroethane c-1.2-Dichloroethene	0.001	0.161	
t-1,2-Dichloroethene	0.001	0.52 0.348	
l.l.l-Trichloroethane		0.316 0.082	
Benzene	0.001 0.001	0.097 0.021	
Carbon Tetrachloride Trichloroethene	0.001 0.001	not detected 1.39	
Toluene Tetrachloroethene	0.001 0.001	0.003 0.013	



EPA	Method	TO-02:	GC/MS	Full	Scan
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Client:	CH2M Hill	Lab #:	10594
Site:	MW-BT-0-7-4 (2nd)	Date Sampled:	4-11-91
Tube #:	2028	Date Analyzed:	4-19-91

Tube #: 2028		Date Analyzed: 4-19-91
Compound	MDL	Concentration
•	ug	ug
Freon 12	0.001	0.051
Vinyl Chloride	0.001	0.025
Freon 11	0.001	not detected
1,1-Dichloroethene	0.001	0.026
Dichloromethane	0.001	0.006
Trichlorotriflouroethane	0.001	0.114
1,1-Dichloroethane	0.001	not detected
c-1,2-Dichloroethene	0.001	not detected
t-1,2-Dichloroethene	0.001	not detected
Chloroform	0.001	not detected
1,1,1-Trichloroethane	0.001	0.007
1,2-Dichloroethane	0.001	not detected
Benzene	0.001	0.003
Carbon Tetrachloride	0.001	not detected
Trichloroethene	0.001	0.002
Toluene	0.001	0.155
Tetrachloroethene	0.001	not detected



EPA Method	TO-02:	GC/MS	Full	Scan
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			· · · · · · · · · · · · · · · ·
Client:	CH2M Hill	Lab #:	10607
Site:	MW-LF-0-7-1 (1st)	Date Sampled:	4-12-91
Tube #:	2007	Date Analyzed:	4-19-91

1100 y. 200		
Compound	MDL	Concentration
	u g	ug
Freon 12	0.001	0.413
Vinyl Chloride	0.001	0.741
Freon 11	0.001	0.155
1,1-Dichloroethene	0.001	11.93
Dichloromethane	0.001	not detected
Trichlorotriflouroethane	0.001	18.7
1,1-Dichloroethane	0.001	0.990
1,2-Dichloroethene	0.001	0.003
-1,2-Dichloroethene	0.001	0.125
Chloroform	0.001	0.003
1,1,1-Trichloroethane	0.001	0.069
1.2-Dichloroethane	0.001	0.031
Benzene	0.001	0.026
Carbon Tetrachloride	0.001	not detected
Trichloroethene	0.001	1.29
Toluene	0.001	0.015
Tetrachloroethene	0.001	0.059



EPA Method	TO-02:	GC/MS	Full	Scan
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 Client:
 CH2M Hill
 Lab #:
 10608

 Site:
 MW-LF-0-7-2 (2nd)
 Date Sampled:
 4-12-91

 Tube #:
 2012
 Date Analyzed:
 4-19-91

Compound	MDL	Concentration	
	ug	ug 	
Freon 12	0.001	0.215	
Vinyl Chloride	0.001	0.003	
Freon 11	0.001	not detected	
1,1-Dichloroethene	0.001	0.005	
Dichloromethane	0.001	0.011	
Trichlorotriflouroethane	0.001	not detected	
1.1-Dichloroethane	0.001	not detected	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	0.002	
1.2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.003	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	not detected	
Toluene	0.001	0.006	
Tetrachloroethene	0.001	not detected	



EPA Method	10-02:	GC/MS	Full	Scan
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Client: CH2M Hill		Lab #:	
Site: MW-LF-0-2-1 (1st)		Date Sampled:	4-12-91
Tube #: 1008		Date Analyzed:	
Compound	MDL	Concentration	
•	ug	ug	
Freon 12	0.001	0.048	
	0.001	not detected	
Freon 11	0.001	not detected	
l,l-Dichloroethene	0.001	0.144	
Dichloromethane	0.001	0.014	
Trichlorotriflourcethane	0.001	0.495	
l,l-Dichloroethane	0.001	0.004	
c-1,2-Dichloroethene	0.001	not detected	
-1.2-Dichloroethene	0.001	not detected	
Chloroform	0.001	not detected	
l,l,l-Trichloroethane	0.001	0.003	
l,2-Dichloroethane	0.001	not detected	
Benzene	0.001	0.002	
Carbon Tetrachloride	0.001	not detected	
Trichloroethene	0.001	0.099	
Toluene	0.001	0.004	
Tetrachloroothene	0.001	not detected	



Client: CH2M Hill Site: MW-LF-0-2-2 (2nd) Tube #: 2018		Lab #: Date Sampled: Date Analyzed:	4-12-91 4-19-91
Compound	MDL	Concentration	
Freon 12	0.001	not detected	••••••••
	0.001	not detected	
	0.001	0.208	
	0.001	0.681	
Dichloromethane	0.001	0.011	
[richlorotriflourcethane	0.001	57.3	
L,1-Dichloroethane	0.001	0.004	
c-1,2-Dichloroethene	0.001	not detected	
t-1,2-Dichloroethene	0.001	0.002	
Chloroform	0.001	not detected	
1.1.1-Trichloroethane	0.001	0.018	
1.2-Dichlorsethane	0.001	not detected	
Benzene	0.001	0.004	
Carbon Tetrachloride	0.001	0.033	
Trichloroethene	0.001	0.096	
Toluene	0.001	0.015	
Tetrachloroethene	0.001	not detected	

SECTION V CH2M HILL SAMPLE TRACKING SPREADSHEET

McCic...an AFB
Area D-Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

	M.W.or V.R.	Lab	Other			Sampled		
Sample Number	Number	I.D.	<u>.</u>	Date	Time	Ву	Disposition	Notes
MW-AC-C-001	-	3001	P-1	3/20/91	11:23 am KE,SD	(E,SD	Close Support	1 1 5 5 5 5 1 5 5 1 5 5 5 5 5 5 5 5 5 5
MW-AC-C-002	-	3002	P-2	3/20/91	11:30 am KE,SD	(E,SD	Close Support	
MW-AC-C-003	-	3003A2.D	P-3	3/20/91	11:35 am KE,SD	(E,SD	Close Support	
MW-AC-0-004	-	10251	AV082	3/20/91	11:20 am KE,SD	(E,SD	Off Site	
MW-B-O-005	-	10252&D		3/20/91	11:20 am KE,SD	(E,SD	Off Site	
MW-T-O-006	-	10253	2005	3/20/91	11:20 am KE,SD	(E,SD	Off Site	
MW-AC-C-007	-	3005	P-5	3/20/91	12:05 pm KE,SD	(E,SD	Close Support	
MW-AC-C-008	-	3004B1.D&A1.D	P-4	3/20/91	12:10 pm KE,SD	(E,SD	Close Support	
MW-AC-C-009	-	3006B1.D&A1.D	P-6	3/20/91	12:15 pm KE,SD	(E,SD	Close Support	
MW-AC-0-010	_	10254	AV127	3/20/91	12:00 pm KE,SD	Œ,SD	Off Site	
MW-B-O-011	-	10255		3/20/91	12:00 pm KE,SD	(E,SD	Off Site	
MW-S-0-012	-	10256	1001	3/20/91	12:00 pm KE,SD	(E,SD	Off Site	
MW-AC-C-013	-	3007A2.D&A1.D	P-7	3/20/91	12:30 pm KE.SD	E.SD	Close Support	
MW-AC-C-014	-	3008A1.D	P-8	3/20/91	12:35 pm KE,SD	(E,SD	Close Support	
MW-AC-C-015	-	3009A1.D	P-9	3/20/91	12:40 pm KE,SD	E.SD	Close Support	
MW-AC-0-016	-	10257	AV125	3/20/91	12:25 pm KE,SD	(E,SD	Off Site	
MW-B-O-017	-	10258		3/20/91	12:25 pm K	KE,SD	Off Site	
MW-T-O-018	-	10259	2003	3/20/91	12:25 pm K	KE,SD	Off Site	
MW-AC-C-019	-	3000	P-10	3/20/91	10:30 am KE,SD	E,SD	Close Support	Blank
MW-AC-O-020	-	10260	AV083	3/20/91	10:40 am K	KE,SD	Off Site	Blank
MW-B-0-021	-	10261		3/20/91	10:55 am K	KE,SD	Off Site	Blank
MW-S-O-022	-	10262	1003	3/20/91	10:30 am K	KE,SD	Off Site	Blank
MW-DR-C-1-1	-	3010A1.D	P-24	3/22/91	11:14 am F	£	Close Support	approx. 50 ppm THC
MW-DR-C-1-2	-	3011A1.D&B1.D	P-23	3/22/91		¥	Close Support	
MW-DR-C-1-3	-	3012A1.D	P-25	3/22/91		¥	Close Support	
MW-HDR-C-1-1	-	3028	P-34	3/29/91		FIK, TIM	Close Support	
MW-HDR-C-1-2	-	3077A1.D	P-74	4/8/91	B:00	美	Close Support	150 ppm
MW-HDR-C-1-3	-	3078A1.D	96-d	4/8/91	ш.	¥	Close Support	
MW-HDR-C-1-4	-	3079A1.D&B1.D	P-75	4/8/91		¥	Close Support	240 ppm
MW-HDR-C-1-5	-	3089A1.D	P-92	4/9/91	_	¥	Close Support	230 ppm
MW-HDR-C-1-6	-	3090A1.D&B1.D	P-97	4/9/91	11:35 R	¥	Close Support	300 ppm

McСкыап AFB Area D--Soil Vapor Testing Sample tracking spreadsheet 5/16/91 KAE

	M.W.or V.R.	Lab	Other			Sampled		
Sample Number	Number	L.D.	1.D	Date	Time	By	Disposition	Notes
MW-B-0-2-1	8	10282		3/27/91	12:40 PM RK,KE	RK,KE	Off-Site	
MW-B-0-2-2	~	10283		3/27/91		PK,KE	Off-Site	
MW-B-0-2-3	8	10284&D		3/27/91		RK,KE	Off-Site	
MW-B-O-2-B	8	10281		3/27/91		RK,KE	Off-Site	
MW-PC-0-2-1	8	10273&D	AV091	3/27/91		GK.KE	Off-Site	
MW-PC-0-2-2	8	10274	AV079	3/27/91		EX,KE	Off-Site	
MW-PC-0-2-3	8	10275&D	AV061	3/27/91		PK,KE	Off-Site	
MW-PC-0-2-B	8	10272	AV400	3/27/91	11:25 AM RK,KE	FK,KE	Off-Site	
MW-PC-0-2-3(dup)	8	10276	AV122	3/27/91		PK,KE	Off-Site	
MW-T-0-2-1	2	10278	2015	3/27/91		PK,KE	Off-Site	
MW-S-0-2-2	8	10279	1008	3/27/91		FK.KE	Off-Site	
MW-T-0-2-3	8	10280	2002	3/27/91		FK,KE	Off-Site	
MW-S-0-2-B	~	10277	1009	3/27/91	11:33 AM FIK,KE	FX,KE	Off-Site	
MW-DR-C-2-1	8	3013A1.D	P-14	3/23/91	10:37 am FIK	ž	Close Support	Approx. 90 ppm THC
MW-DR-C-2-2	8	3014A1.D&B1.D	P-19	3/23/91	1:47 pm	差	Close Support	90 ppm THC
MW-DR-C-2-3	8	3015A1.D	P-12	3/23/91		芙	Close Support	Approx 80 pom THC
MW-PC-C-2-B	8	3019A1.D	P-22	3/27/91	11:28 AM PK,KE	PK,KE	Close Support	
MW-PC-C-2-1	8	3020A2.D	P-21	3/27/91		PK,KE	Close Support	85 PPM
MW-PC-C-2-2	8	3021A1.D&B1.D	P-18	3/27/91		FK,KE	Close Support	100 PPM
MW-PC-C-2-2(dup)	~	3022A2.D	P-17	3/27/91		FK,KE	Close Support	100 PPM
MW-PC-C-2-3	N	3023A1.D	P-11	3/27/91		PK,KE	Close Support	
MW-B-O-3-1	က	10291		3/28/91	1:54 pm	ž	Off-Site	
MW-B-O-3-2	က	10292		3/28/91		PK.KE	Off-Site	
MW-B-O-3-3	က	10293&D		3/28/91		PK,KE	Off-Site	
MW-B-O-3-3(dup)	က	10294		3/28/91		RK,KE	Off-Site	
MW-B-O-3-B	က	10295		3/28/91		¥	Off-Site	
MW-AC-0-3-1	9	10296	AV016	3/28/91	13:54	关	Off-Site	3.5 ppm

McCleuan AFB
Area D.—Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

Some Milmon	M.W.or V.R.	Lab	Other	910	Timo	Sampled	o di	Story
Sample recinion	i i i i i i i i i i i i i i i i i i i	<u>i</u>	<u>.</u>	<u>Cale</u>		f o	Cisposition	rotes
MW-AC-0-3-2	6	10297	AV069	3/28/91	14:36	RK,KE	Off-Site	3.5 ppm
MW-AC-0-3-3	က	10298	AV123	3/28/91	15:26	RK,KE	Off-Site	
MW-AC-0-3-B	က	10299	AV057	3/28/91	13:37	풒	Off-Site	
MW-S-0-3-1	ო	10300	1006	3/28/91	13:54	爰	Off-Site	3.5 ppm
MW-S-0-3-1(dup)	æ	10304	5	3/28/91	13:54	差	Off-Site	3.5 ppm
MW-S-0-3-2	n	10301	1005	3/28/91	14:40	差	Off-Site	
MW-T-0-3-3	က	10302	2012	3/28/91	15:23	RK,KE	Off-Site	
MW-T-O-3-B	ო	10303	2014	3/28/91	12:47	RK,KE	Off-Site	23 min.
MW-DR-C-3-1	m	3016	P-20	3/25/91	10:16 am RK	¥	Close Support	13 pom THC
MW-DR-C-3-2	m	3017	15	3/25/91	12:55 pm	美	Close Support	13 ppm THC
MW-DR-C-3-3	60	3018A1.D	P-13	3/25/91	4:57 pm	¥	Close Support	16.8 ppm
MW-AC-C-3-1	ღ	S3024A1.D	P-50	3/28/91	13:38	¥	Close Support	3.5 ppm
MW-AC-C-3-2	က	3025A1.D&B1.D	P-35	3/28/91	14:27	RK,KE	Close Support	3.5 ppm
MW-AC-C-3-3	9	S3026.D	P-40	3/28/91	15:09	RK,KE	Close Support	
MW-AC-C-3-B	က	S3027A1.D	P-45	3/28/91	12:30	差	Close Support	
MW-B-0-4-1	*	10429		4/8/91	14:13	KE,SD,CO	Off-Site	7.6 ppm
MW-B-0-4-2	▼	10430		4/8/91	14:45	KE,SD,CO	Off-Site	7.5 ppm
MW-B-0-4-3	₹	10431		4/8/91	15:11	KE,SD,CO	Off-Site	7.5 ppm
MW-B-O-4-B	→	10428		4/8/91	13:25	KE,SD,CO	Off-Site	
MW-AC-0-4-1	4	10412	AV122	4/8/91	14:00	KE,SD,CO	Off-Site	7.6 ppm
MW-AC-0-4-2	→	10413	AV131	4/8/91	14:44	KE,SD,CO	Off-Site	7.5 ppm
MW-AC-0-4-3	4	10414	AV094	4/8/91	15:12	KE,SD,CO	Off-Site	7.5 ppm
MW-AC-0-4-B	4	10411	E027	4/8/91	13:22	KE,SD,CO	Off-Site	
MW-T-0-4-1	4	10420	2026	4/8/91	14:19	KE,SD,CO	Off-Site	7.6 ррт
MW-T-0-4-2	4	10421	2025	4/8/91	14:50	KE,SD,CO	Off-Site	7.5 ppm
MW-T-0-4-3	4	10422	2027	4/8/91	15:19	KE,SD,CO	Off-Site	7.5 ppm
MW-T-0-4-B	~	10419	2018	4/8/91	13:46	KE,SD,CO	Off-Site	
MW-DR-C-4-1	4	3058A2.D	P-60	4/4/91	09:55	RK,BC	Close Support	9.0 ppm

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Area D--Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

Sample Number	M.W.or V.R.	Lab	Other	o je C	Timo	Sampled		
	BOILDA!	2	<u>:</u>	Cale	AEII-	ah	Disposition	Notes
MW-DR-C-4-2	4	3059A1.D	P-56	4/4/91	11:57	PK.BC	Close Support	8.2 ppm
MW-DR-C-4-3	4	3060A1.D	P-59	4/4/91	13:57	FFK,BC	Close Support	8.7 ppm
MW-AC-C-4-1	4	3073A1.D	P-82	4/8/91	14:02	KE,SD,CO	Close Support	7.6 pom
MW-AC-C-4-2	4	3074A1.D	P-77	4/8/91	14:33	KE,SD,CO	Close Support	7.5 000
MW-AC-C-4-3	4	3075A1.D	P-91	4/8/91	15:04	KE,SD,CO	Close Support	7.5 ppm
MW-AC-C-4-B	4	3076A1.D	P-86	4/8/91	13:20	KE,SD,CO	Close Support	
MW-B-0-5-1	S	10424		4/8/91	10:55	KE,SD,CO	Off-Site	1.9 pom
MW-B-0-5-2	S	10425		4/8/91	11:35	KE,SD,CO	Off-Site	1.4 ppm
MW-B-O-5-3	2	10426		4/8/91	12:13	KE,SD,CO	Off-Site	2.9 ppm
MW-B-0-5-4	2	10427		4/8/91	11:12	KE,SD,CO	Off-Site	1.9 ppm, DUP OF MW-B-O-5-1
MW-B-O-5-B	S	10423		4/8/91		KE,SD,CO		
MW-AC-0-5-1	ĸ	10408	AV089	4/8/91	10:50	KE.SD.CO	Off-Site	1.9 000
MW-AC-0-5-2	S	10409	AV105	4/8/91	11:23	KE.SD.CO	Off-Site	1 4 DOM
MW-AC-0-5-3	S	10410	AV083	4/8/91	12:04	KE,SD,CO	Off-Site	2.9 pom
MW-AC-0-5-B	ĸ	10407	AV092	4/8/91	10:13	KE,SD,CO	Off-Site	
MW-S-0-5-1	S	10416	1006	4/8/91	10:50	KE.SD.CO	Off-Site	1.9 non
MW-T-0-5-2	ĸ	10417	2002	4/8/91	11:23	KE,SD,CO	OII-Site	1.4 pom
MW-S-0-5-3	ĸ	10418	1008	4/8/91	12:04	KE,SD,CO	Off-Site	2.9 ppm
MW-T-O-5-B	S	10415	2012	4/8/91	10:13	KE,SD,CO	Off-Site	
MW-DR-C-5-1	S	3050A1.D	P-54	4/3/91	09:53	BC,RK	Close Support	1.4 pom
MW-DR-C-5-2	ß	3051A1.D	P-55	4/3/91	11:56	BC,RK	Close Support	2.6 pom
MW-DR-C-5-3	ß	3052A1.D	P-52	4/3/91	13:57	BC,RK	Close Support	2.8 ppm
MW-AC-C-5-1	2	3070A1.D	P-73	4/8/91	10:56	KE,SD,CO	Close Support	1.9 ppm
MW-AC-C-5-2	2	3071A1.D	P-76	4/8/91	11:26	KE,SD,CO	Close Support	1.4 ppm
MW-AC-C-5-3	S	3072A1.D&B1.D	P-70	4/8/91	12:00	KE,SD,CO	Close Support	2.9 ppm
MW-AC-C-5-B	'n	3069A1.D	P-81	4/8/91	10:02	KE,SD,CO	Close Support	:
MW-B-O-6-1	9	10390		4/6/91	13:26	RK,SD,KE	Off-Site	1.8 ppm
MW-B-O-6-2	9	10391		4/6/91	14:17	RK,SD,KE	Off-Site	1.9 ppm

McCieuan AFB
Area D.--Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

Sample Number	M.W.or V.R. Number	Lab I.D.	Other I.D.	Date	Тітв	Sampled By	Disposition	Notes
MW-B-O-6-3	9	10392	; ; ; ; ;	4/6/91	14:44	RK.SD.KE	Off-Site	1.7 ppm
MW-B-O-6-B	ဖ	10389		4/6/91	12:30	PK,SD,KE	Off-Site	
MW-AC-0-6-1	g	10394	AV103	4/6/91	13:32	PK,SD,KE	Close Support	1.8 ppm
MW-AC-0-6-2	9	10395	AV091	4/6/91	13:57	RK,SD,KE	Close Support	1.9 ppm
MW-AC-0-6-3	9	10396	AV114	4/6/91	14:40	PK,SD,KE	Close Support	1.7 ppm
MW-AC-0-6-4	9	10397	AV077	4/6/91	13:57	RK,SD,KE	Close Support	1.9 ppm, DUP OF MW-AC-0-6-2
MW-AC-0-6-B	9	10393	AV016	4/6/91	12:33	RK,SD,KE	Close Support	
MW-T-0-6-B	ဖ	10398	2020	4/6/91		RK,SD,KE	Off-Site	
MW-T-0-6-1 first	9	10399A	2014	4/6/91	13:30	AK,SD,KE	Off-Site	1.8 ppm
MW-T-0-6-1 secon	9	10399B	2003	4/6/91	13:30	RK,SD,KE	Off-Te	1.8 ppm
MW-S-0-6-2 lirst	9	10400A	1001	4/6/91	14:01	RK,SD,KE	Off-Site	1.9 ppm
MW-S-0-6-2 secon	9	10400B	1005	4/6/91	14:01	RK,SD,KE	Off-Site	1.9 ppm
MW-T-0-6-3 lirst	9	10401A	2019	4/6/91	14:41	RK,SD,KE	Off-Site	1.7 ppm
MW-T-0-6-3 secon	9	10401B	2015	4/6/91	14:41	RK,SD,KE	Off-Site	1.7 ppm
MW-S-0-6-4 first	9	10402A	1007	4/6/91	14:01	RK,SD,KE	Off-Site	1.9 ppm, DUP OF MW-S-O-6-2
MW-S-O-6-4 secon	9	10402B	1003	4/6/91	14:01	RK,SD,KE	Off-Site	1.9 ppm, DUP OF MW-S-O-6-2
MW-DR-C-6-1	9	3042A1.D	P-47	4/2/91	12:50	BC,RK	Close Support	6.8 ppm
MW-DR-C-6-2	9	3043A1.D	P-46	4/2/91	13:50	BC,FIK	Close Support	0.4 ppm
MW-DR-C-6-3	9	3044A1.D	P-53	4/2/91	16:10	BC, PK	Close Support	1.5 ppm
MW-DR-C-6-4	9	3045A1.D	P-41	4/2/91	17:00	BC, PK	Close Support	1.3 ppm
MW-AC-C-6-1	9	3065A1.D	P-61	4/6/91	13:17	RK,SD,KE	Close Support	1.8 ppm
MW-AC-C-6-2	9	3066A1.D	P-62	4/6/91	13:48	RK,SD,KE	Close Support	1.9 ppm
MW-AC-C-6-3	9	3067A1.D	P-66	4/6/91	14:25	RK,SD,KE	Close Support	1.7 ppm
MW-AC-C-6-B	ဖ	3068A1.D	P-67	4/6/91	12:30	RK,SD,KE	Close Support	
MW-B-0-7-1	7	10331		4/2/91	11:47	SD.KE	Off-Site	430 ppm
MW-B-0-7-2	7	10332		4/2/91	12:31	SD.KE	Off-Site	415 pom
MW-B-0-7-3	~	10333		4/2/91	12:55	SD,KE	Off-Site	430 ppm
MW-B-0-7-4	7	10334		4/2/91	12:31	SD,KE	Off-Site	DUP. OF MW-B-0-7-2
MW-B-0-7-B	7	10335		4/2/91	10:50	SD,KE	Off-Site	

McCte...an AFB
Area D--Soil Vapor Testing
Sample tracking spreadsheet
5/16/9 'AE

Sample Number	M.W.or V R. Number	ra O	L.D.	Date	Time	By	Disposition	Notes
2 C O O WWW		10327	A 0.05	412/01	11.45	SD KE	Off-Sile	430 000
	•	1905	3		?	120		10000
MW-AC-0-7-2	7	10328&D	A018	4/2/91	12:28	SD,KE	Oil-Site	415 ppm
MW-AC-0-7-3	7	10329	E045	4/2/91	12:59	SD,KE	Off-Site	430 ppm
MW-AC-0-7-B	7	10330	AV036	4/2/91	10:20	SD,KE	Off-Site	
MW-T-0-7-1	7	10322	2009	4/2/91	11:50	SD,KE	Off-Site	430 ppm
MW-T-0-7-2	7	10323	2017	4/2/91	12:30	SD,KE	Off-Site	415 ppm
MW-S-0-7-3	^	10324	1002	4/2/91	13:03	SD,KE	Off-Site	430 ppm
MW-T-0-7-4	7	10325	2006	4/2/91	11:50	SD,KE	Off-Site	DUP. OF MW-T-0-7
MW-T-0-7-B	7	10326	2019	4/2/91	10:36	SD,KE	Off-Site	
MW-BT-0-7-1 FIR	7	10403	2021	4/6/91		¥	Off-Site	
MW-BT-0-7-1 SEC	7	10404	2029	4/6/91		差	Off-Site	
MW-BT-0-7-2 FIR	7	10405	1009	4/6/91		妄	Off-Site	
MW-BT-0-7-2 SEC	7	10406	1000	4/6/91		芙	Off-Site	
MW-BT-0-7-3 FIR	7	10591	2024	4/11/91	11:15	差	Off-Site	460 ppm
MW-BT-0-7-3 SEC	7	10592	2022	4/11/91	11:15	丢	Off-Site	460 ppm
MW-BT-0-7-4 FIR	7	10593	2023	4/11/91	12:17	差	Off-Site	460 ppm
MW-BT-0-7-4 SEC	7	10594	2028	4/11/91	12:17	¥	Off-Site	460 ppm
MW-DR-C-7-1	7	3029A1.D	P-39	3/30/91	10:55	RK,TM	Close Support	180 ppm
MW-DR-C-7-2	7	3030B1.D&B2.D	P-30	3/30/91	12:29	FK,TM	Close Support	140 ppm
MW-DR-C-7-3	7	3031A1.D	P-44	3/30/91	18:16	FK,TM	Close Support	440 ppm
MW-AC-C-7-1	7	3038A1.D	P-42	4/2/91	11:35	SD,KE	Close Support	430 ppm
MW-AC-C-7-2	7	3039	P-27	4/2/91	12:20	SD,KE	Close Support	415 ppm
MW-AC-C-7-3	7	3040A1.D	P-32	4/2/91	12:48	SD,KE	Close Support	430 ppm
MW-AC-C-7-B	7	3041A1.D	P-37	4/2/91	10:22	SD,KE	Close Support	
MW-HDR-C-7-1	7	3091A1.D	P-89	4/10/91	02:30	PK,CO	Close Support	
MW-HDR-C-7-2	7	3105A1.D	P-121	4/10/91	12:24	FK,CO	Close Support	
MW-HDR-C-7-3	7	3114A1.D	P-107	4/11/91	11:19	FK,CO	Close Support	арргох. 450 ррт
MW-HDR-C-7-4	7	3115A1.D	P-102	4/11/91	12:33	HK,CO	Close Support	арргох. 450 ррт
MW-B-0-8-1	00	10342		4/3/91	11:40	SD,KE	Off-Site	160 ppm
MW-B-0-8-2	60	10343		4/3/91	12:50	SD,KE	Off-Site	145 ppm
MW-B-0-8-3	· «	10344&D		4/3/91	13:00	SD.KE	Off-Site	180 pgm

McCleudn AFB
Area D.-Soil Vapor Testing
Sample tracking spreadsheet
\$716/91 KAE

Sample Number	M.W.or V.R. Number	Lab I.D.	Other I.D.	Date	Time	Sampled By	Disposition	Notes
MW-B-O-8-B	80	10345	; ; ; ; ; ; ;	4/3/91	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SD,KE	Off-Site	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;
MW-AC: 0-8-1	6 0	10347&D	E022	4/3/91	11:54	SD,KE	Off-Site	160 ppm
MW-AC-0-8-2	80	10348	AV065	4/3/91	12:30	SD,KE	Off-Site	145 ppm
MW-AC-0-8-3	∞	10349	AV123	4/3/91	13:12	SD,KE	Off-Site	180 ppm
MW-PC-0-8-4	∞	10350	E047	4/3/91	11:52	SD,KE	Off-Site	DUP. OF MW-AC-0-8-1
MW-PC-0-8-5	€	10351	AV108	4/3/91	12:30	SD,KE	Off-Site	DUP. OF MW-AC-0-8-2
MW-PC-0-8-6	80	10352&D	AV098	4/3/91	13:12	SD,KE	Off-Site	DUP. OF MW-AC-0-8-3
MW-AC-0-8-B	∞	10346	AV106	4/3/91		SD,KE	Off-Site	
MW-T-0-8-1	6 0	10338	2000	4/3/91	11:48	SD,KE	Off-Site	160 ppm
MW-S-0-8-2	80	10339	1001	4/3/91	12:31	SD,KE	Off-Site	145 ppm
MW-T-0-8-3	80	10340	2010	4/3/91	13:13	SD,KE	Off-Site	180 ppm
MW-S-0-8-B	6 0	10341	1000	4/3/91		SD,KE	Off-Site	
MW-DR-C-8-1	6 0	3032A1.D	P-48	3/31/91	12:17	RK,TM	Close Support	175 ppm
MW-DR-C-8-2	80	3033A1.D	P-49	3/31/91	14:02	RK,TM	Close Support	180 ppm
MW-DR-C-8-3	6 0	3034A1.D	P-43	3/31/91	16:03	PK,TM	Close Support	190 ppm
MW-AC-C-8-1	6 0	3046A1.D	P-26	4/3/91	11:32	SD,KE	Close Support	160 ppm
MW-AC-C-8-2	6 0	3047A1.D	P-36	4/3/91	12:10	SD,KE	Close Support	145 ppi
MW-AC-C-8-3	œ	3048A2.D	P-31	4/3/91	12:56	SD,KE	Close Support	180 ppm
MW-AC-C-8-B	∞	3049A1.D	P-51	4/3/91	10:47	SD,KE	Close Support	
MW-B-0-9-1	თ	10367&D		4/4/91	11:44	SD,KE	Off-Site	58 ppm
MW-B-0-9-2	თ	10368		4/4/91		SD,KE	Off-Site	58 ppm
MW-B-0-9-3	o	10369		4/4/91	13:17	SD,KE	Off-Site	58 ppm
MW-B-0-9-4	တ	10370		4/4/91	13:17	SD,KE	Off-Site	DUP. OF MW-B-09-3
MW-B-O-9-B	o	10371		4/4/91	10:27	SD,KE	Off-Site	
MW-AC-0-9-1	6	10364	AV069	4/4/91	12:03	SD,KE	Off-Site	58 ppm
MW-AC-0-9-2	6	10365	AV400	4/4/91	12:26	SD,KE	Off-Site	58 ppm
MW-AC-0-9-3	6	10366	AV057	4/4/91	13:18	SD,KE	Off-Site	58 ppm
MW-AC-0-9-B	6	10363	AV079	4/4/91	10:35	SD,KE	Off-Site	

McCleuan AFB

Area D.—Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

Samole Number	M.W.or V.B.	Lab	Other	Date	Time	Sampled Bv	Disposition	Selon
			<u> </u>					
MW-T-0-9-1	6	10358	2010	4/4/91	11:59	SD,KE	Off-Site	58 ppm
MW-T-0-9-2 FIRST	6	10359	2004	4/4/91	12:36	SD,KE	Off-Site	58 ppm
MW-T-0-9-2 SECO	6	10360	2013	4/4/91	12:36	SD,KE	Off-Site	58 ppm
MW-T-0-9-3 FIRST	6	10361	2011	4/4/91	13:21	SD,KE	Off-Site	58 ppm
MW-T-0-9-3 SECO	6	10362	2008	4/4/91	13:21	SD,KE	Off-Site	58 ppm
MW-T-0-9-B	6	10356	2007	4/4/91	10:44	SD,KE	Off-Site	
MW-DR-C-9-1	6	3035B1.D	P-28	4/1/91	11:20	RK,BC	Close Support	50 ppm
MW-DR-C-9-1	6	3036B1.D	P-38	4/1/91	13:23	PK, BC	Close Support	52 ppm
MW-DR-C-9-1	6	3037A1.D	P-33	4/1/91	15:30	FIK, BC	Close Support	53 ppm
MW-AC-C-9-1	6	3053A1.D&B1.D	P-58	4/4/91	11:45	SD,KE	Close Support	58 ppm
MW-AC-C-9-2	6	3054A1.D	P-57	4/4/91	12:18	SD,KE	Close Support	58 ppm
MW-AC-C-9-3	6	3055A1.D	P-64	4/4/91	13:09	SD,KE	Close Support	58 ppm
MW-AC-C-9-4	6	3056A1.D	P-63	4/4/91	11:45	SD,KE	Close Support	DUP OF MW-AC-C-9-1
MW-AC-C-9-B	6	3057A1.D	P-65	4/4/91	10:29	SD,KE	Close Support	
MW-HDR-C-9-1	6	3106A1.D	P-94	4/10/91	12:47	PK,CO	Close Support	55 ppm
MW-HDR-C-9-2	6	3107B1.D	P-117				Close Support	
MW-HDR-C-9-3	o	3116A1.D	P-127	4/11/91	12:47	FK,CO	Close Support	
MW-HDR-C-9-4	o	3127A1.D	P-115	4/11/91	14:59	FIK,CO	Close Support	mdd 09
VR-B-0-31-B	3-1	10372		4/5/91	13:40	BC,RK,KE	Off-Site	
VR-B-0-31-1	3-1	10373		4/5/91	14:30	BC,RK,KE	Off-Site	1 ppm
VR-B-0-31-2	3-1	10374		4/5/91	14:54	BC, RK, KE	Off-Site	1 ppm
VR-B-0-31-3	3-1	10375		4/5/91	15:18	BC, RK, KE	Off-Site	0.9 ppm
VR-B-0-31-4	3-1	10376		4/5/91	14:23	BC,RK,KE	Off-Site	DUP OF VR-B-0-31-1
VR-AC-C-31-B	3-1	3064A1.D	P-71	4/5/91	13:40	BC,RK,KE	Close Support	
VR-AC-C-31-1	3-1	3061A1.D	P-72	4/5/91	14:30	BC, RK, KE	Close Support	1 ppm
VR-AC-C-31-2	3-1	3062A1.D	P-69	4/5/91	14:59	BC,RK,KE	Close Support	1 ppm
VR-AC-C-31-3	3-1	3063A2.D	P-68	4/5/91	15:22	BC, RK, KE	Close Support	0.9 ppm

Also took condensate vials on the above 7 samples, very little condensate.
Condensate vials were numbered the same as the above, except a "V" was added to the end.
Condensate vials were not analyzed.

McCleuran AFB
Area D...-Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

; ; ; ; ;	B-0-43-2	AC-C-43-1	3-0-44-1		
Notes	1 ppm 1 ppm 0.8 ppm DUP OF VR-B-O-43-2	1 ppm 1 ppm 0.8 ppm DUP OF VR-AC-C-43-1	1.6 ppm 1.5 ppm 1.4 ppm DUP OF VR-B-O-44-1	1.6 ppm 1.5 ppm 1.4 ppm Not Analyzed	1.2 ppm 1.0 ppm 0.8 ppm
Disposition	Off-Site Off-Site Off-Site Off-Site	Close Support Close Support Close Support Close Support Close Support	Off-Site Off-Site Off-Site Off-Site Off-Site Off-Site	Close Support Close Support Close Support Close Support Off-Site	Off-Site Off-Site Off-Site
Sampled By	SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO	SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO	SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO	SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO	SD,KE,CO SD,KE,CO SD,KE,CO SD,KE,CO
Time	11:10 12:01 12:19 12:42 12:23	11:12 11:58 12:28 12:55 11:58	13:42 14:10 14:39 14:56 14:07	13:42 14:19 14:42 15:04	9:25 10:10 10:26 11:10
Date	4/9/91 4/9/91 4/9/91 4/9/91	4/9/91 4/9/91 4/9/91 4/9/91	4/9/91 4/9/91 4/9/91 4/9/91 4/9/91	4/9/91 4/9/91 4/9/91 4/9/91	4/10/91 4/10/91 4/10/91
Other I.D.		P-83 P-87 P-93 P-98		P-78 P-80 P-84 P-85	
Lab I.D.	10438 10439 10440 10442	308781.D 308081.D 308181.D 3082A1.D 3083A1.D	10448 10443 10444 10445 10446	3087B1.D 3085A1.D 3086B1.D 3088A1.D	10511
M.W. or V.R. Number	4 4 4 4 6 - 4 4 6 6 - 4 6 6 6 - 4 7	4 4 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	4 4 4 4 4 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6	4 4 4 4 4	4444
Sample Number	VR-B-O-43-B VR-B-O-43-1 VR-B-O-43-2 VR-B-O-43-3 VR-B-O-43-4	VR-AC-C-43-B VR-AC-C-43-1 VR-AC-C-43-2 VR-AC-C-43-3 VR-AC-C-43-4	VR-V-O-43 VR-B-O-44-B VR-B-O-44-1 VR-B-O-44-2 VR-B-O-44-3 VR-B-O-44-4	VR-AC-C-44-B VR-AC-C-44-1 VR-AC-C-44-2 VR-AC-C-44-3	VR-B-O-42-B VR-B-O-42-1 VR-B-O-42-2 VR-B-O-42-3

McClenan AFB

Area D.-Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

P-79 4/10/91 10:02 P-100 4/10/91 10:02 P-100 4/10/91 10:40 P-95 4/10/91 11:10 4/10/91 12:10 4/10/91 12:12 P-106 4/10/91 12:12 P-111 4/10/91 12:12 P-111 4/10/91 12:12 P-111 4/10/91 12:13 P-101 4/10/91 12:20 P-99 4/10/91 12:20 A/10/91 14:14 A/10/91 14:14 P-122 4/10/91 14:14 P-124 4/10/91 14:40 P-124 4/10/91 14:20 P-124 4/10/91 14:40 P-123 4/10/91 14:20 P-124 4/10/91 14:40	Sample Number	M.W.or V.R. Number	Lab I.D.	Other I.D.	Date	Time	Sampled By	Disposition	Notes
4-2 3097 P-90 410091 10:02 4-2 3093 P-100 4/10/91 10:02 4-2 3093 P-100 4/10/91 10:02 4-2 3094 P-95 4/10/91 10:02 4-2 4/10/91 10:02 6-1 10555 4/10/91 12:10 6-1 10556 4/10/91 12:12 6-1 3099B1.D P-106 4/10/91 12:12 6-1 3099A1.D P-111 4/10/91 12:12 6-1 3099A1.D P-111 4/10/91 12:29 6-1 3099A1.D P-101 4/10/91 12:36 6-1 3099A1.D P-101 4/10/91 12:36 6-1 30996 D-101 4/10/91 12:36 3-4 10560 D 4/10/91 14:14 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-123 4/10/91 15:26	C-C-42-B	4-2	9606	P-79	4/10/91	09:25	SDKFCO	Close Support	
4-2 3093 P-100 410091 10:40 4-2 3094 P-95 4/10/91 11:10 4-2 4/10/91 11:10 6-1 10555 4/10/91 12:10 6-1 10556 4/10/91 12:10 6-1 10558 4/10/91 12:10 6-1 3099A1.D P-106 4/10/91 12:12 6-1 3099A1.D P-111 4/10/91 12:20 6-1 3099A1.D P-101 4/10/91 12:36 6-1 3099A1.D P-101 4/10/91 12:36 6-1 3099A1.D P-101 4/10/91 12:36 6-1 3096 P-99 4/10/91 12:36 3-4 10569 4/10/91 14:30 3-4 10569 4/10/91 14:30 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-124 4/10/91 15:26	C-C-42-1	4-2	3097	P-90	4/10/91	10:02	SD KF CO	Close Support	1 2 000
4-2 3094 P-95 4/10/91 11:10 4-2 4/10/91 12:10 6-1 10555 4/10/91 12:10 6-1 10556 4/10/91 12:34 6-1 10558 4/10/91 12:57 6-1 10558 4/10/91 12:57 6-1 3099A1.D P-106 4/10/91 12:56 6-1 3095A1.D P-111 4/10/91 12:56 6-1 3095A1.D P-116 4/10/91 12:36 6-1 10559 P-99 4/10/91 12:36 3-4 10559 4/10/91 14:14 3-4 10562 4/10/91 14:14 3-4 3102A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-123 4/10/91 15:06	C-C-42-2	4-2	3093	P-100	4/10/91	10:40	SD.KE.CO	Close Support	mgg 1:-
6-1 10555 4/10/91 12:10 6-1 10556 4/10/91 12:10 6-1 10558 4/10/91 12:34 6-1 10558 4/10/91 12:57 6-1 3098A1.D P-106 4/10/91 12:12 6-1 3092A1.D P-111 4/10/91 12:59 6-1 3095 P-99 4/10/91 12:36 6-1 3095 P-99 4/10/91 12:36 6-1 10565 4/10/91 12:36 3-4 10560B.D 4/10/91 14:30 3-4 10563 4/10/91 15:29 3-4 3102A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-124 4/10/91 15:26 3-4 3103A1.D P-123 4/10/91 15:26 3-4 3103A1.D P-123 4/10/91 15:26	C-C-42-3	4-2	3094	P-95	4/10/91	11:10	SD,KE,CO	Close Support	0.8 ppm
6-1 10555 4/10/91 12:10 6-1 10556 4/10/91 12:34 6-1 10558 4/10/91 12:57 6-1 309981.D P-106 4/10/91 12:12 6-1 309981.D P-111 4/10/91 12:12 6-1 309981.D P-111 4/10/91 12:36 6-1 309981.D P-111 4/10/91 12:36 6-1 309981.D P-111 4/10/91 12:36 6-1 30956.D P-101 4/10/91 12:36 3-4 10569 4/10/91 14:14 3-4 10563 4/10/91 15:10 3-4 3102A1.D P-122 4/10/91 14:30 3-4 3103A1.D P-124 4/10/91 15:06 3-4 3104B1.D P-123 4/10/91 15:06	-0-42	4-2			4/10/91			Off-Site	Not Analyzed
6-1 10556 4/10/91 12:34 6-1 10556 4/10/91 12:34 6-1 10558 4/10/91 12:34 6-1 3098A1.D P-106 4/10/91 12:12 6-1 3099A1.D P-111 4/10/91 12:36 6-1 3095A1.D P-111 4/10/91 12:36 6-1 3095 P-99 4/10/91 12:36 6-1 10560&D 4/10/91 14:30 3-4 10560&D 4/10/91 14:30 3-4 10563 4/10/91 14:30 3-4 10563 4/10/91 14:30 3-4 3102A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:05	8. F3.	4	40455				() ()	ë	
6-1 10557 4/10/91 12:57 6-1 3098B1.D P-106 4/10/91 12:12 6-1 3099A1.D P-111 4/10/91 12:12 6-1 3092A1.D P-111 4/10/91 12:36 6-1 3095 P-101 4/10/91 12:36 6-1 3095 P-99 4/10/91 12:36 3-4 10560 4/10/91 14:30 3-4 10561 4/10/91 15:10 3-4 10563 4/10/91 15:29 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-123 4/10/91 15:03	0-61-1	- +	10555		10001/4	01:21	SD, KE, CO		C
6-1 10558 4/10/91 12:12 6-1 3099A1.D P-106 4/10/91 12:12 6-1 3099A1.D P-111 4/10/91 12:36 6-1 3095 P-101 4/10/91 12:36 6-1 3095 P-99 4/10/91 12:36 6-1 10569 4/10/91 14:14 3-4 10569 4/10/91 14:14 3-4 10563 4/10/91 14:14 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 15:03 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:03	.0-61-2		10557		1000 X	10.51	SD, NE, CO		3.8 ppm
6-1 3098B1.D P-106 4/10/91 12:12 6-1 3092A1.D P-111 4/10/91 12:12 6-1 3092A1.D P-116 4/10/91 12:59 6-1 3095 P-101 4/10/91 12:59 6-1 3095 P-99 4/10/91 12:36 3-4 10569 4/10/91 14:14 3-4 10563 4/10/91 14:14 3-4 10563 4/10/91 14:14 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:03	0-61-3		10558		4/10/91	13.15	SD KF CO	Off-Site	5.3 ppm
6-1 3099A1.D P-106 4/10/91 12:12 6-1 3092A1.D P-111 4/10/91 12:36 6-1 3095 P-111 4/10/91 12:36 6-1 3095 P-101 4/10/91 12:36 6-1 3095 P-99 4/10/91 12:36 6-1 10565 4/10/91 14:14 3-4 10560&D 4/10/91 14:14 3-4 10563 4/10/91 14:30 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 15:03 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:03						2			
6-1 3099A1.D P-111 4/10/91 12:36 6-1 3092A1.D P-116 4/10/91 12:59 6-1 3095 P-101 4/10/91 12:59 6-1 10565 P-99 4/10/91 12:36 3-4 10560&D 4/10/91 14:14 3-4 10561 4/10/91 15:10 3-4 10563 4/10/91 15:10 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:03	C-C-61-B	6-1	3096B1.D	P-106	4/10/91	12:12	SD,KE,CO	Close Support	
6-1 3092A1.D P-116 4/10/91 12:59 6-1 3095 P-101 4/10/91 12:20 6-1 3095 P-99 4/10/91 12:36 3-4 10560&D 4/10/91 14:14 3-4 10561 4/10/91 14:30 3-4 10562 4/10/91 15:29 3-4 10563 4/10/91 15:29 3-4 3102A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:03	C-C-61-1	6-1	3099A1.D	P-111	4/10/91	12:36	SD,KE,CO	Close Support	3.8 ppm
6-1 3100 P-101 4/10/91 13:20 6-1 3095 P-99 4/10/91 12:36 3-4 10569 4/10/91 14:14 3-4 105604D 4/10/91 14:14 3-4 10562 4/10/91 15:29 3-4 10563 4/10/91 15:29 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3103A1.D P-123 4/10/91 15:03	2-C-61-2	6-1	3092A1.D	P-116	4/10/91	12:59	SD,KE,CO	Close Support	5.3 ppm
6-1 10565 P-99 4/10/91 12:36 3-4 10559 4/10/91 14:14 3-4 10560&D 4/10/91 14:14 3-4 10562 4/10/91 15:29 3-4 10563 4/10/91 15:29 3-4 10563 4/10/91 14:14 3-4 3102A1.D P-122 4/10/91 14:14 3-4 3103A1.D P-124 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:03	C-C-61-3	6-1	3100	P-101	4/10/91	13:20	SD,KE,CO	Off-Site	5.5 oom
6-1 10565 4/10/91 3-4 10560&D 4/10/91 14:14 3-4 10561 4/10/91 14:30 3-4 10562 4/10/91 15:10 3-4 10563 4/10/91 15:29 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 14:40 3-4 3103A1.D P-123 4/10/91 15:26	2-C-61-4	6-1	3095	P-99	4/10/91	12:36	SD,KE,CO	Close Support	DUP OF VR-AC-C-61-1
3-4 10559 4/10/91 14:14 3-4 10560&D 4/10/91 14:30 3-4 10561 4/10/91 15:10 3-4 10562 4/10/91 15:29 3-4 10563 4/10/91 15:29 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 14:40 3-4 3103A1.D P-123 4/10/91 15:26	0-61	6-1	10565		4/10/91			Off-Site	
3-4 10560&D 4/10/91 14:30 3-4 10561 4/10/91 15:10 3-4 10562 4/10/91 15:29 3-4 10563 4/10/91 14:30 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 14:00 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:26	0-34-8	9-4	10559		4/10/91	14:14	SD,KE.CO	Off-Site	
3-4 10561 4/10/91 15:10 3-4 10562 4/10/91 15:29 3-4 10563 4/10/91 14:30 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 14:00 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:05	0-34-1	9-6	10560&D		4/10/91	14:30	SD.KE.CO	Off-Site	2.5 com
3-4 10562 4/10/91 15:29 3-4 10563 4/10/91 14:30 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 14:40 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:05	0-34-2	3-4	10561		4/10/91	15:10	SD,KE,CO	Off-Site	1.5 com
3-4 10563 4/10/91 14:30 3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 14:40 3-4 3103A1.D P-123 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:26	0-34-3	3-4	10562		4/10/91	15:29	SD,KE,CO	Off-Site	1.5 ppm
3-4 3101A1.D P-122 4/10/91 14:14 3-4 3102A1.D P-124 4/10/91 14:40 3-4 3103A1.D P-113 4/10/91 15:03 3-4 3104B1.D P-123 4/10/91 15:26	0-34-4	3-4	10563		4/10/91	14:30	SD,KE,CO	Off-Site	DUP OF VR-B-0-34-1
3-4 3102A1.D P-124 4/10/91 14:40 3-4 3103A1.D P-118 4/10/91 15:03 3-4 310AB1.D P-123 4/10/91 15:26	7-C-34-B	3-4	3101A1.D	P-122	4/10/91	14:14	SD,KE,CO	Close Support	
3-4 3103A1.D P-118 4/10/91 15:03 3-4 310AB1.D P-123 4/10/91 15:26	7-C-34-1	3-4	3102A1.D	P-124	4/10/91	14:40	SD,KE,CO	Close Support	2.5 ppm
3-4 310481.D P-123 4/10/91 15:26	>-C-34-2	3-4	3103A1.D	P-118	4/10/91	15:03	SD.KE.CO	Close Support	1.5 000
	7-C-34-3	3-4	3104B1.D	P-123	4/10/91	15:26	SD,KE,CO	Close Support	1.5 ppm

McCle...an AFB
Area D.-Soil Vapor Testing
Sample tracking spreadsheet
\$716/91 KAE

Sample Number	M.W.or V.R. Number	Lab I.D.	Other 1.D.	Date	Tıme	Sampled By	Disposition	Notes
VR-V-0-34	3-4	1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	4/10/91	! ! !	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Off-Site	Not Analyzed
VR-B-0-35-B	3-5			4/11/91	10:50	SD.KE	Off-Site	
VR-B-0-35-1	3-5	10582		4/11/91	11:22	SD,KE	Off-Site	0.3 pom
VR-B-0-35-2	3-5	10583		4/11/91	11:47	SD,KE	Off-Site	0.1 ppm
VR-B-0-35-3	3-5	10584		4/11/91	12:14	SD,KE	Off-Site	0.1 ppm
VR-AC-C-35-B	3-5	3108B1.D	P-103	4/11/91	10:50	SD.KE	Close Support	
VR-AC-C-35-1	3-5	3110A1.D	P-109	4/11/91	11:22	SD,KE	Close Support	0.3 ppm
VR-AC-C-35-2	3-5	3112A1.D	P-113	4/11/91	11:45	SD,KE	Close Support	0.1 ppm
VR-AC-C-35-3	3-5	3113A1.D	P-108	4/11/91	12:12	SD,KE	Close Support	0.1 pom
VR-PC-C-35-4	3-5	3109B1.D	P-112	4/11/91	11:22	SD,KE	Close Support	PRES. DUP OF VR-AC-C-35-1
VR-PC-C-35-5	3-5	3111A1.D	P-104	4/11/91	11:46	SD,KE	Close Support	PRES. DUP OF VR-AC-C-35-2
VR-V-0-35	3-5			4/11/91	11:46	SD,KE	Off-Site	Not Analyzed
VR-B-0-39-B	9-6	10586		4/11/91	13:57	SD.KE	Off-Site	
VR-B-0-39-1	3-9			4/11/91	14:19	SD.KE	Off-Site	2.2 nom
VR-B-0-39-2	3-9	10587		4/11/91	14:52	SD.KE	Off-Site	0.600
VR-B-O-39-3	3-9	10589		4/11/91	15:16	SD,KE	Off-Site	0.6 ppm
VR-AC-C-39-B	3-9	3120B1.D	P-105	4/11/91	13:57	SD,KE	Close Support	
VR-AC-C-39-1	3-9	3117A1.D	P-128	4/11/91	14:18	SD,KE	Close Support	2.2 ppm
VR-AC-C-39-2	3-9	3118A1.D	P-126	4/11/91	14:52	SD.KE	Close Support	0.600m
VR-AC-C-39-3	3-9	3119B1.D	P-114	4/11/91	15:15	SD,KE	Close Support	0.6 ppm
VR-V-O-39	3-9			4/11/91		SD,KE	Off-Site	Not Analyzed
VR-8-0-36-8	3-6	10599		4/11/91	15:34	C) XH	Off-Site	
VR-B-0-36-1	3-6	10600		4/11/91	16:00	BK CO	Off-Site	
VR-B-0-36-2	3-6	10601		4/11/91	16:18	X CO	Off-Site	2.3 ppm 1 6 ppm
VR-B-0-36-3	3-6	10602		4/11/91	16:34	RK,CO	Off-Site	1.6 ppm

McClenan AFB
Area D.—Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

					7. 26. 1	C-36-3										_											
Notes		2 S DOM	16.008	16.00m	PBES DIID OF VB-AC-C-36 1	PRES. DUP OF VR-AC-C-36-3									DUP OF VR-AC-C-13-1	DUP OF VR-AC-C-13-2			100 FFM	MA-190	100 PPM		Later analyzed off-cite	Later analyzed off-cito	Later analyzed off cite	Later analyzed off-site	Later analyzed off-site
Disposition	Close Support	Close Support	Close Support	Close Support	Off-Site	Close Support	Off-Site	Off-Site	Off-Site	Off-Site	Off-Site	Off-Site	OII-Site	Off-Site	Off-Site	Off-Site					Off-Site		Close Support				
Sampled By	EK.CO	PK.CO	RK CO	EK CO	E CO	PK,CO	PK,CO	FK.CO	PK.CO	RK,CO	PK.CO	PK.CO	PK.CO	PK,CO	PK,CO	PIK,CO		2		2,5	X S		PK CO	EK CO	BK CO	X C	FK,CO
Time	15:34	16:00	16:18	16:34	16:00	16:34					11:36	12:19	12:30	12:40	12:19	12:30		4.4.4	2 ;	14.10	14:32		15:57	15:57	14.15	14:20	14:37
Date	4/11/91	4/11/91	4/11/91	4/11/91	4/11/91	4/11/91	4/12/91	4/12/91	4/12/91	4/12/91	4/12/91	4/12/91	4/12/91	4/12/91	4/12/91	4/12/91		*0/47/0	4/15/21	4/12/91	4/12/91		4/12/91	4/12/91	4/12/91	4/12/91	4/12/91
Other I.D.	P-146	P-110	P-120	P-145	P-119	P-125					P-140	P-150	P-135	P-149	P-148	P-139		7000	2000	2012	1008		P-129	P-132	P-134	P-133	P-130
Lab 1.0.	3121	3122A1.D	3123A1.D	3124A1.D	3125	3126A1.D	10603	10604	10605	10606	3128	3129	3130	3131	3140	3139		10607	10608	9			3135	3136	3137	3138	3141
M.W.or V.R. Number	3-6	3-6	3-6	3-6	3-6	3-6	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3	1-3		,	. ^	۰ ۵	~	, tubes	7	7	8	: N	٥
Sample Number	VR-AC-C-36-B	VR-AC-C-36-1	VR-AC-C-36-2	VR-AC-C-36-3	VR-PC-C-36-4	VR-PC-C-36-5	VR-B-0-13-B	VR-B-0-13-1	VR-B-0-13-2	VR-B-0-13-3	VR-AC-C-13-B	VR-AC-C-13-1	VR-AC-C-13-2	VR-AC-C-13-3	VR-AC-C-13-4	VR-AC-C-13-5	I our Flow Tubbe	MW-1 F-0-7-1 FIRS	MW-1 F-0-7-2 SEC	MW-LF-0-2-1 FIRS	MW-LF-0-2-2 SEC	Cans taken with low flow tubes	MW-LFAC-C-7-1	MW-LFAC-C-7-2	MW-LFAC-C-2-1	MW-LFAC-C-2-2	MW-LFAC-C-2-3

McClettan AFB
Area D--Soil Vapor Testing
Sample tracking spreadsheet
5/16/91 KAE

Sample Number	M.W.or V.R. Number		Other I.D.	Date	Time	Sampled By	Disposition	Notes
MW-LFAC-C-2-4	2	3142&D	P-138	4/12/91	14:42	RK,CO	Close Support	Later analyzed off-site
Ambient Air Samples AA-AC-C-1 AA-AC-C-2		3133 3134	P-143 P-144	4/12/91	16:40	AK,CO	Close Support Close Support	Later analyzed cff-site Later analyzed off-site

SECTION VI CH2M HILL FIELD NOTES

	DAILY INSPECTION DIARY	PAGE		A7
			SK 28727.	
	DATE: 14.1.9.1 WORK PER		REPORT NO.	
	THER TEMP. MAX F: MIN F:	PRECIPITATION		
NUMB	BER AND CLASS OF PERSONNEL EMPLOYED:			
	1.07			
	MAJOR EQUIPMENT ON PROJECT	T AND AMOUNT OF USE		· · · · · · ·
NO.	2017 DESCRIPTION		SIZE/CAPACITY	HRS. OPE
	SZID È FID			
	2)18			
	1222			
	1			
	TOTAL SYSTEM SAMPLE FLOW :	•	ROTAMETER	
	WITIAL PPM = IM			
	INITIAL PPM = 100	• . •		
	START CHARLOAL TUBLS & TW	/ %	Eclmin	
	START CHARLOAL TUBES & TW	/ %	Ec/min	
		/ %	Ec/min	
	START CHARLOAL TUBES & TWO	E FLOW SÕ	Ec/min	
	START CHARLOAL TUBES & TRU TO MIN SAMPLES START @ 14:10 Hours	E FLOW SÕ		w/z
	START CHARLOAL TUBES & TW 10 MIN SAMPLES START @ 14:10 Hours STOP @ 14:20 Hours - VAW 1-A(-C-2-4	-/K E FLOW 50		w/z
	START CHARLOAL TUBES & TRU 10 MIN SAMPLES START @ 14:10 Hours STOP @ 14:20 Hours - VAN - A(- (- 2 - 4) START @ 14:32 Hours	-/K E FLOW 50		w/z
	START CHARLOAL TUBES & TW 10 MIN SAMPLES START @ 14:10 Hours STOP @ 14:20 Hours - VAW 1-A(-C-2-4	-/K E FLOW 50		w/z
	START CHARLOAL TUBES & TRU 10 MIN SAMPLES START @ 14:10 Hours STOP @ 14:20 Hours - VAN - A(- (- 2 - 4) START @ 14:32 Hours	-/K E FLOW 50		w/z
	START CHARLOAL TUBLS & TWO MIN SAMPLES START @ 14:10 Hours STOP @ 14:20 Hours - VAN START @ 14:32 Hours 14:42 Hours U#7 FRARLOAL LOW FLOW	-/K E FLOW 50		w/z
	START CHARLOAL TUBES & TW. 10 MIN SAMPLES START @ 14:10 Hours START @ 14:20 Hours - VAN START @ 14:32 Hours 14:42 Hours 14:42 Hours	E FLOW SÖ		w/z

RESIDENT'S SIGNATURE

DATE

DAILY INS	PECTION DIARY	PAGE	_ OF	
		PROJECT NO.		**
DAY:	DATE: 04 11 9 WORK	PERIOD A.M. TO	A.M. _P. M. REPORT NO.	
	TEMP. MAX°F: MIN°F:			
	OF PERSONNEL EMPLOYED:			
······································				<u> </u>
<u> </u>				
	MAJOR EQUIPMENT ON PRO	NECT AND AMOUNT OF US		
NO.	DESCRIPTION	·	SIZE/CAPACITY	HRS. OP
SR - 10	+ F1D			ļ
				
			_	-
				ļ
		·	<u> </u>	<u> </u>
START &	EXMPLES @ 3.46	PM		
INITIAL PR	PM = 3.5	· · · · · · · · · · · · · · · · · · ·		
AFTEL #1	SAMPLE ~ 1.5 PPM	•		
	<u> </u>		Andrew.	·
			·	
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	<u>, , , , , , , , , , , , , , , , , , , </u>	·	<u> </u>	<u></u>
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<u> </u>	sitt.		- :	•
	ALC P		· · · · · · · · · · · · · · · · · · ·	
	2.5			
				
	-7 IM AL	= 10 "47" + mu	101.0	
			4.0	

(8.1)

FORM 21C

DAILTII	NSPECTION DIAR	Υ	PAGE	OF	
					<u> </u>
)AY:	DATE: 0.4	WORK PERIO	D P.M. TO	_P.M. REPORT NO.	
VEATHER	TEMP. MAX	°F: MIN°F:	PRECIPITATION		
IUMBER AND CL	ASS OF PERSONNEL EN	MPLOYED:			:
	- :				
		· 			
		· 			
	MAIOR	EQUIPMENT ON PROJECT	AND AMOUNT OF U	<u> </u>	
NO.	MAJON	DESCRIPTION	AND AMOUNT OF US	SIZE/CAPACITY	HRS. OF
FID &	4 5-10 PIC	K 110			
	4				
	······				
					~
ORK ACCOMPLIS	SHED TODAY:	MW # 77 Rec	DULKY SAM	pres d	
ORK ACCOMPLIS	SHED TODAY:	MW # 77 Reco	DL BASAKT	PLLS &	LUATI
HIGHER	JOLUME CHA	MW # 77 Reco	DE BRIAKT	HROUGH FEUA	LUATI
10:51:38	STARTED CHA	INLOAL TUBES F	DL BAZAKT Szrils @ 10	HROUGH FEUA	LUATI
10:51:38 0N POSI	STARTED CHAI	RESIDE OF PUM 99 CLIMIN	DE BREAKT	HROUGH EVA	LUATI
10:51:38 0N POSI	STARTED CHAI	RESIDE OF PUM 99 CLIMIN	DE BREAKT	HROUGH EVA	LUATO
10:51:32 ON POSI @ 11:1:	STARTED CHAITIVE PRESSURI FUNNING ZOZ4 = 157	REDAL TUBES F REDAL TUBES IN E SIDE OF PUM E 99 CC/MIN T, ZOZZ = Z	DE BREAKT	HROUGH EVA	LUATO
10:51:32 ON POSI C 11:1:	STARTED CHAI	REDAL TUBES F REDAL TUBES IN E SIDE OF PUM E 99 CC/MIN T, ZOZZ = Z	DE BREAKT	HROUGH EVA	LUATI
FIGHER 10:51:38 ON POSI CAU	STARTED CHAINTIVE PRESSURI TIVE PRESSURI FUNNING ZOZ4 = 157 PIOT TAKEI	REDAL TUBES F REDAL TUBES IN E SINE OF PUM E 99 CC/MIN F, ZOZZ = Z N & 11:19	DE BREAKT SIRILS @ 10 P SHUT OFF JO (CONDE	HROUGH EVA	LUATI
10:51:38 ON POSI CAN TUBES	STARTED CHAINE TIVE PRESSURI TOTA TAKE	TOTE = 2018	DE BREAKT SIRILS @ 10 P SHUT OFF LONDE	HROUGH EVA	CULTIS
10:51:38 ON POSI CAN TUBES	JOLUME CHA STARTED CHA TIVE PRESSURE FRUNINA ZOZ4 = 1 ³⁷ PIOT TAKE 2023 = 1 ⁵ T AT 12:17	E SINE OF PUM POZZ = Z POZS = Z POCC/MIN	DE BREAKT SIRIES @ 10 P SHUT OFF LO (CONDE W/ WATER	HROUGH FEVA OCC/MINI NSATE DIFFIC	NE
10:51:38 ON POSI CAN TUBES	JOLUME CHA STARTED CHA TIVE PRESSURE FRUNINA ZOZ4 = 1 ³⁷ PIOT TAKE 2023 = 1 ⁵ T AT 12:17	TOTE = 2018	DE BREAKT SIRIES @ 10 P SHUT OFF LO (CONDE W/ WATER	HROUGH EVA	NE
HIGHER 10:51:39 ON POSI CII:1: TUBES CAU TUBES START	JOLUME CHA STARTED CHA TIVE PRESSUR! 5 RUUNINA 2024 = 1 ⁵⁷ 7107 TAKE! 2023 = 1 ⁵⁷ AT 12:17 C 12:18	2028 = 2" 2028 = 2" 2028 = 2" 2028 = 2"	DE BREAKT SIRIES @ 10 P SHUT OFF WO (CONDE W/ WATER PPM R	HROUGH FUA OCC/MINI NOATE DIFFIC	NE
TUBES TUBES TUBES TOBES	STARTED CHAINE STARTED CHAINE PRESSUR! S RUUNING ZOZ4 = 157 PIOT TAKE! 2023 = 15T AT 12:17 PIOT BE TAKE	TOPE TUBES FOR PUMP OF	DE BREAKT SIRIES @ 10 P SHUT OFF WO (CONDE W/ WATER PPM R	HROUGH FUA OCC/MINI NOATE DIFFIC	NE
TUBES START	STARTED CHAINE STARTED CHAINE PRESSUR! S RUUNING ZOZ4 = 157 PIOT TAKE! 2023 = 15T AT 12:17 PIOT BE TAKE	2028 = 2" 2028 = 2" 2028 = 2" 2028 = 2"	DE BREAKT SIRIES @ 10 P SHUT OFF WO (CONDE W/ WATER PPM R	HROUGH FUA OCC/MINI NOATE DIFFIC	NE

RESIDENT'S SIGNATURE

CAN P-115 TAKEN @ 14:59 HOURS OF MW #9

ROTAMETER READING 47 MM - 18 349.67 ML M.N

DATE

10

DAILY INSI	PECTION DIARY	PAGE(•
WEATHER	DATE: 0.410.814.11 WORK PE TEMP. NAX°F: MIN°F: B OF PERSONNEL EMPLOYED:		M. REPORT NO.	
				·
	MAJOR EQUIPMENT ON PROJE	ECT AD AMOUNT OF USE		
NO.	DESCRIPTION		SIZE/CAPACITY	HRS. OPE
F10 4	5-10 PIEICUPP			
1	Pump			
111				
				
				
@ 12:20	PPM = 460 D @ 12:24			
		はいいゅん ひってき	METTE =	
	WLLT = 10 IN HS VA	, 1017	16	741 m
PUMP	-	·	16	75 M
Pump Move T	TO MW #9 @ 12:3	<u> </u>	16	,741 ~
PUMP MOVE T	TO MW #9 @ 12:3	SI FAMPLE F	16	,741 ~
PUMP MOVE T B 12:0	TO MW #9 @ 12:3 47 TOOK HOCT FIBER METEL & 48 MM 18	31. 1.22 M Prs 1 FA 1,751 M P/m.N	16	,741 ~
PUMP MOVE T POTOM VACUE	TO MW #9 @ 12:3 47 TOOK HIGH FIBER METTL & 48 MM 18 UM @ PUMP INLET E	31. 1.22 M Prs 1 FA 1,751 M P/m.N	16	,741 ~
PUMP MOVE T POTOM VACUE	TO MW #9 @ 12:3 47 TOOK HOCT FIBER METEL & 48 MM 18	31. 1.22 M Prs 1 FA 1,751 M P/m.N	16	,741 ~
PUMP MONE T POTOM VACUE PIM 2 17:06	TO MW #9 @ 12:3 47 TOOK HICH FIDER METIL & 48 MM 18 UM @ PUMP INLET = =55	51. 1. MAMPLE 1 FO 1.751 M.P./m.N 6 M. H.S.	16 2024 M.W.)	#9
PIMP MOVE T PIM 2 17:06	TO MW #9 @ 12:3 47 TOOK HICH FIDER METIL & 48 MM 18 UM @ PUMP INLET = =55	51. 1. MAMPLE 1 FO 1.751 M.P./m.N 6 M. H.S.	16 2024 M.W.)	#9
PUMP MONE T POTOM VACUE PIM CAN PII	TO MW #9 @ 12:3 HT TOOK HICH FIDER METIL & 48 MM 18 UM @ PUMP INLET = = 55 PPM = 55 IT TAKIN INITIAL P	1	16 2024 M.W.)	#9
PUMP MOVE T ROTAM VACUE PPM CAU PII ROTAM2:	TO MW #9 C. 12:3 HT TOOK HIGH FIDE METIL & 48 MM 18 UM & PUMP INLET = = 55 PPM = 55 IT TAKIN INITIAL PI TIL = 48 MM 18,75	1	OM MAN	#9
PUMP MOVE T ROTAM VACUE PPM CAU PII ROTAM2:	TO MW #9 @ 12:3 HT TOOK HICH FIDER METIL & 48 MM 18 UM @ PUMP INLET = = 55 PPM = 55 IT TAKIN INITIAL P	1	OM MAN	#9

RESIDENT'S SIGNATURE

DATE

	PECTION DIARY	PAGE	OF	
		PROJECT NO		
DAY:	DATE: 0.410.919 WORK PERIOD	8 TO	.M. REPORT NO.	
NEATHER	TEMP. MAX°F: MIN°F: P	RECIPITATION		
	OF PERSONNEL EMPLOYED:			
· · · · · · · · · · · · · · · · · · ·				
				
	MAJOR EQUIPMENT ON PROJECT A	ND AMOUNT OF USE		
NO.	DESCRIPTION		SIZE/CAPACITY	HRS. OPE
E10 4	5-10 PICK UP			
110 9	3 10 1762 01		 	
			•	
	READING ZOO PPM Z C	LIMBING		
CAN P.93	INITIAL PRESSURE 3 3	O" HG VACUUM	1	
CONCENTRA	TION = 250 PPM @ END	OF SAMPLING	A THIS CA	<u>J</u>
	= 47 18,349.7 Me/MIN			
_	•			
_			•	
ROTAMITEL	7 INITIAL PASSUAE:	30" HG VAC		
Can P-9	7 INITIAL PRESSURE:		uum_	
CAN P-9 CONTRA	TION = 300 PPM @ SAM	PLL STALT		
CAN P-9 CONTRA		PLL STALT		
CAN P-9 CONTRA	TION = 300 PPM @ SAM	PLL STALT		
CAN P-9 CONTRA	TION = 300 PPM @ SAM	PLL STALT		
CAN P-9 CONTRA	TION = 300 PPM @ SAM	PLL STALT		
CAN P-9 CONTRA	TION = 300 PPM @ SAM	PLL STALT		
CAN P-9 CONTRA	TION = 300 PPM @ SAM	PLL STALT		

DAILY II	NSPECTION DIA	? Y		PAQE	~	`
-						<u> </u>
)DAY:	DATE: 0.4	0871	WORK PERIOD	6 9 TO	.M. REPORT NO.	
WEATHER	TEMP. MAX	°F: MIN_	°F: P	RECIPITATION		
	ASS OF PERSONNEL E					
					·	
		_				
						
						·
NO.	MAJO	R EQUIPMENT DESCRIPTION		AND AMOUNT OF USE	SIZE/CAPACITY	HRS. OPE
,	5-10 Pul				SIZE/CAPACITY	HRS. OF
	S-10 PICK N PUMP					
HIFCO	2 TOMP					
	TA.					
				· · · · · · · · · · · · · · · · · · ·	 	
			······································			
PUMP	274R = 46)" Ha	15,170.0	,		
-						
	HRS PPM			0.1		
POTAN	1274R = 46	<u> 17, </u>	947:5 "	M. K. Jun I N		
PUMP	INLET &	11 Hg				
@ 19:45 r	LE PPM	THC =				
	TAR = 46		947.5 1	4.0 1.00.01		
		I's" Ha	171.3	· · · · · · · · · · · · · · · · · · ·		
			•			
			*			
						
		.,		Terrent in the second s		

DAILY	INSPECTION DIARY	PAGE	OF	The grant
		PROJECT NO		
	DATE: 0.4:089 WORK PER			
	TEMP. MAX°F: MIN°F:	PRECIPITATION		
(2) NUMBER AND C	LASS OF PERSONNEL EMPLOYED:			
				
(3)	MAJOR EQUIPMENT ON PROJECT	AND AMOUNT OF USE		
NO.	DESCRIPTION		SIZE/CAPACITY	HRS. OPER
j				
		<u> </u>		
<u></u>		<u> </u>		<u> </u>
	ISHED TODAY: MW \$1 HIG.			
START I	USTRUMENT (FID) ZERO @	07:32		
-WITIAL	THE LEADING = 150 PP	Μ		
- D	LOTA METER LEADING = 47	MM 18,34	7.7 me/m, ~	ر
	THE READING = 17	<u> </u>		
6 0800	THE REAGING - 114	NO 1310 LE	- 1200021	45
D 10:41	6 THL READING = 20	3 PPM		
	POTAMETER = 47 MM			
2	-	10, 21		
	INLET VACUUM = 10" Hg			
<u> </u>				
<u>e 11:28</u>	THE READING = 210 PPM	(2 , , , , , ,		
	LOTAMETER = 46.5 Mm.	.0,140.6		
- ?,	IMP INLET = 10" Hg			

@ 12:19	THE - 210 PPM	<u> </u>		<u> </u>
	POTEMENTE = 47.0 MM 1	8,349,7		
	Pump wax = 10" 49			
			· · · · · · · · · · · · · · · · · · ·	
(A) 1/1:00	THC = 208 PPM			
17:00	ROTAMETER = 46.5 18	148.6		
	KOTAMETER 46.5	}		

ROTAMETER = 46.5 PUMP INLET = -10

	DATE: Q.4					REPORT NO.	
	TEMP. MAX		°F: PRE	CIPITATION			
IUMBER AND C	LASS OF PERSONNE	L EMPLOYED:					
							
							
*							
						·	
	MA	JOR EQUIPMENT	ON PROJECT AND	AMOUNT OF	USE		
NO.		DESCRIPTIO)N		SI	ZE/CAPACITY	HRS. OPE
		<u> </u>					
		•					
				···	. 9		1
				-			
				7			
0		المراكب معدد	701				4
Pump ¿	TD MW :	AL TO 16	o ce/m	N C STA			
PUMP & TUBES HYDROCA		AL TO 16	00 ce/m,	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA	1009 = 1 1004 = 1	AL TO 16	00 ce/m,	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAW 20	1009 = 1 1009 = 1 120013 = 1	AL TO 16 *T 1000 480 PPM	00 ce/m, = 240 \ w/ 29 +mper! c	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAW 20	0 RIFICE C	AL TO 16 T 1000 POST SA	00 ce/m,	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	00 ce/m, = 240 - 24	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAW 20	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 T 1000 POST SA	00 ce/m, = 240 - 24	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	00 cc/m, = 240 - 24	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 24 +MPER C 17:07 F CC/MIN	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 200 - 200 - 200 - 17:09 F	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 24 +MPER C 17:07 F CC/MIN	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 24 +MPER C 17:07 F CC/MIN	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 24 +MPER C 17:07 F CC/MIN	N E STA	et,	Eren	خن
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 24 +MPER C 17:07 F CC/MIN	N E STA	et,	Eren	
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 24 +MPER C 17:07 F CC/MIN	N E STA	et,	Eren	
PUMP & TUBES HYDROCA RAN 20 TUBES	0 RIFICE (1009 = 1 12013 = 1 1 MINS 2021 = 1 ³ 2029 = 2 ⁴	AL TO 16 *T 1000 480 PPM ** ** ** ** ** ** ** ** ** ** ** ** **	20 cc/m, = 200 - 24 +MPER C 17:07 F CC/MIN	N E STA	et,	Eren	

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	ATE: CEC. 46 P	\	TO	M. REPORT NO.	
WEATHER - TI	PAR. MAX 10 P! MIN 1	¥_°F: PRECIPITATIO	W D		
NUMBER AND CLASS OF	PERSONNEL EMPLOYED:				
7				· · · · · · · · · · · · · · · · · · ·	
	"				_
NO.		ON PROJECT AND AMOUNT	T OF USE	0175/0494017/	1 1170 00
NO.	DESCRIPTION:		 	SIZE/CAPACITY	HRS. OP
\\-\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u></u>	A 196 1140			
	<u> </u>				
	· · · · · · · · · · · · · · · · · · ·	<u> </u>			
			12	4	
WORK ASSESSMENT TO THE		e - Franc		·	
WORK ACCOMPLISHED TO	_	/± - 1 1	1		
1245 - 61911 se	tup for visety	1 -3-1 , stor	+ FIL) marmina	24-
had all.		1	<u>_</u>	- 3 4.51	3
220- Calibrate	EZD: zero pot a	L. U.T. som	mlat	4.86 +8	2
345 - take a se			lives 1		11
	r of Harry att	er purging all	THAT U	Mr. Ne.	
'eylinder P-7		30" 100 (6			.63
350 - Regin pump	ing on west isses			Contract of the second	4.0
	1 37 2 E 5	Say - 131	C 16		
1410 - began 7	B. Say set	of so Ribe"	21 mas	Ican)
The pegan	radis 0: - 430	There was		GEU	<i></i>
(07) 15	THICK PURE TO SE	56 20 11 20 11 20 1	* * * * * * * * * * * * * * * * * * *	<i>N</i>	- 4-
3 vials	Totens 0150	_, Smoti ami	ont 1	f condu	NSI II
and so	me descis "III	egch viich.	200 M	्रस्थ 🚜	
7	nove E. E. There	Page 18 Survey	te si	8 4 8 8 2	
1194 - 119	AMORGEN M	Orm Visto	tran-	100m	•
770	Se The Selection		1 : 17 2	S. S. S. S.	
	Star Var. 1()	-471 - C VE	ببجد	sameas	POV
	The same of		K (/ ::	J	
1507 - 5	W 3 S colo	& samble !!	6 1 be	astin	<u>. </u>
can		DIG		1	5
<u> </u>	CTI 2 LAND		e de la constante de la consta		<u></u>
	HILY 2 HAY DAY	MY CHIEF TOU	print !		NZ_
1530- isspan				THE POINT OF LEGG A 1800	
1530- iespan zero Det	responsed di 4.79	the second statements	****	MAN Y F	in .
1530- isspan	responded to 4.79	a second second		44. 4 · F	1 /
1530- isspan zero pet	responded di 4.79	*	****	4	1//
1530- isspan	responsed di 4.71	A Section of the second of the			1.7

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(1) DAY: 18 /15 DAFE: 1	24044 WORK PERIOD	R TO. SHOW IN
	AAX 78_°F: MIN 50_°F: PRECIPI NNEL EMPLOYED:	TATION
being Colling- Tech	<u> </u>	
3)	MAJOR EQUIPMENT ON PROJECT AND AI	MOUNT OF USE
NO.	DESCRIPTION	BIZE/CAPACITY HRE C
1 J.U.M. FID	md. UE7 3 9261291	
1 Method 6 gos	rain box #	\$.
1 bokogawa and 30	057 portable recorder	
1 Colimon powers	nate 2250 walt general	or Bracky
WORK ACCOMPLISHED TODAY:	1110-5	**************************************
More - arrive on si	le of MW-4 + begins	setting wa FID A.
1855 - cluck cal on		son out at 5200
A	(Hed. OD an leave soon	pot a sign spined control
الماريان	en min	1
HOURS #4 DAY OF CH	win Hel reading to TOO	P & 1 2 A 1
CTD - CTD	A C COM D CAM LIKE	-10 modi il
PID BYPAN	ACCOUNTS AND ACCOUNTS	We come of
0955 - Sample, telen 1	200 ET 60 , 1980 A	7 30; Ha
- 1 bar - 271	SICKE PARTY	U.S. A.I. KON
PID by poss ?	GS SCFIF P. S Emp 64	A COLESCION IN
1157 Somple total	ALLE OFF-56 PAST	AK 24 119
" bx > 299.	Carrie - Dass	Bank SAN
FIDE ST	SAR BOY IF COM RELEASE	40 65 M
1357 06	PARTY RATIONAL	30314
世	ALMER DAVE . C.	MAN LE MAN COO
FIN	SOFAL If name to neces	LE WELL
1 300		100
1405 - D	E and The second	
_ missi span morning		
- (? " + r ? Spih -	MANY TO AN ANY LABOR. THE	
14/5- Short down Fi	Private ratings and the	
1430- Finish bricking d	mm a sponyme about case comme	
<u> </u>		The said states of the said states
	RESIDENT'S SIGNATURE	DATE
	(0.1)	FOR

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	PROJECT NO. 26722 03.02
AV: Work PERIODO	REPORT NO
ranger i 🖟 🖟 🕟	IPITATION
PARTY CORM - TECH	
sary Collem - 186h	
MAJOR EQUIPMENT ON PROJECT AND	AMOUNT OF THE
IO. DESCRIPTION	SIZE/CAPACITY HRE O
1 J.U.M FID md VE-7 #9261290	
1 Method (a gas train box	
1 Volcogence and 3057 portable recorder	
1 Colomon powerwade 2750 with generalor:	# 2917864
ORK ACCOMPLISHED TODAY: MW.5	•
0800- acrive on site + begin setting up t	ETD at
	4, son pot at 4,20
	L 4557 84
half to the and an	by pass: 1550 Min
76 60 Y ! 72 B, 8	
945- hook up to MW-5 + start rumps, 50	d (=="/")
427 1	54 at <-30" Hg
#6 box = 1381 CF - ppm=	1,4
	MELE 1.1 SCFH
56- Sparel tobon in cyl. 755,	P55 at < 30" Hg
#61-box = 254.5 CF fom =	2.6.
FID bypgss = 6 SCFH Pump &	upois . I.O SCFH
87 Smith from to con # 852, P.S	5t of 530" Hg.
-6 273.8 CF Nom=	28 0
FI Goiss 6 SEH TO LIMO b	in = 1.1 SCFH (400 9
110-15his FID + all- Fixel med	lines:
EL ETE OCE MAN A	a above to see and
STA because a should be out to	mes as whent is a - it is it is
200 00 00 00 00 00 00 00	- our it sale
TAYO PAT THE TAY THE SAME	No.
115 - aismonth of hip + flows - all got infinite	
	

· · ·	ECTION DAR		PROJEC	TNO. 54 25 25 11	,03.02
DAY:	DATE: 0.4 C	2.2.1 WORK P	ERIOD A.M. TO	A.M. REPORT N	Q
WEATHER	TEMP. MAX	°F: MIN°F:	PRECIPITATION.		
	ABB OF PERSONNEL EN		· •		
					
		-	·/		·
<u> </u>	MAJOR	EQUIPMENT ON PRO	ECT AND AMOUNT O)E 1/85	
NO.		DESCRIPTION		SIZE/CAPACITY	Y HRS. OPE
		\	·		
		₩			
		• X			
		<i>, y</i>			
		7			
pre	np byposs = 450	. CYMIN	6 box = 128;	7 CF .	<u> </u>
Firel Ma	dings- # E	60x: 228,8 D mods 885	e F Bem	2 CF	
Firel Ma	dings- #6 E	D Mods 885 D Mods 885 D Mods D 2650 Coffeein 450 Coffeein	CF Apm Apm		
Firel Ma	dings- # E	2004: 228,8 D Mods 885 D Mods D 2650 Cofmin 450 Cofmin 450 Cofmin	CF Apm Apm		
Firel Ma	dings- # E	2004: 228,8 D Mods 885 D Mods D 2650 Cofmin 450 Cofmin 450 Cofmin	CF Apm Apm		J gear.
Firel Ma	dings- # E	2004: 228,8 D Mods 885 D Mods D 2650 Cofmin 450 Cofmin 450 Cofmin	CF Apm Apm		J gear.
Final reg	dings- # E	2004: 228,8 D Mods 885 D Mods D 2650 Cofmin 450 Cofmin 450 Cofmin	CF Apm Apm		J gear.
Final reg	dings- # E	2007: 228,8 D Mods 885 D Mods 0 1650 Cofmin 450 Cofmin Li- MOCYMIN Cor Minsters	CF Apm Apm	of bothles + show	J gear.
Final reg	dings- #6 & con gas - FI ero gas - FE ID by pass- ID exhaus off, pack up off she	2007: 228,8 D Mods 885 D Mods 0 1650 Cofmin 450 Cofmin Li- MOCYMIN Cor Minsters	CF Apm Apm	of bothles + show	J gear.
Final reg	dings- # E	2007: 228,8 D Mods 885 D Mods 0 1650 Cofmin 450 Cofmin Li- MOCYMIN Cor Minsters	CF Apm Apm	of bodles a slow	J gear.
Final reg	dings- #6 & con gas - FI ero gas - FE ID by pass- ID exhaus off, pack up off she	2007: 228,8 D Mods 885 D Mods 0 1650 Cofmin 450 Cofmin Li- MOCYMIN Cor Minsters	CF Apm Apm Close all que	of bodles a slow	J gear.
Final reg	dings- #6 & con gas - FI ero gas - FE ID by pass- ID exhaus off, pack up off she	2007: 228,8 D Mods 885 D Mods 0 1650 Cofmin 450 Cofmin Li- MOCYMIN Cor Minsters	CF Apm Apm Close all que	of bothles a show	J gear.
Final reg	dings- #6 & con gas - FI ero gas - FE ID by pass- ID exhaus off, pack up off she	2007: 228,8 D Mods 885 D Mods 0 1650 Cofmin 450 Cofmin Li- MOCYMIN Cor Minsters	cr ppm ppm Close all ge	of bothles a show	J gear.
Final reg	dings- #6 & con gas - FI ero gas - FE ID by pass- ID exhaus off, pack up off she	D Mods 885 D Mods 885 D Mods D D Mods D 2650 Cephilia 450 Cephilia L- MOCYMIN	cr ppm ppm Close all ge	of bothles a show	J gear.
Final reg	dings- #6 & con gas - FI ero gas - FE ID by pass- ID exhaus off, pack up off she	D Mods 885 D Mods 885 D Mods D D Mods D 2650 Cephilia 450 Cephilia L- MOCYMIN	cr ppm ppm Close all ge	of bothles a show	gear.

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FORM 21C

DATE: 0.4 0.2 9.1 WORK PERIODOM	TO TO REPORT NO
WEATHER GUILLE TEMP. MAX 75 °F: MIN50° FE PRECIPITATI	
2) NUMBER AND CLASS OF PERSONNEL EMPLOYED:	
Borns Collom - Tech	
THE STATE OF THE S	
3) MAJOR EQUIPMENT ON PROJECT AND AMOUNT	NT OF USE
NO. DESCRIPTION	SIZE/CAPACITY HRS. OPE
1 J.U.M. FID wd VE-7 \$ 9261290	
1 Method 6 box gas tain	
1 Yokogaux ad 3057 portable recorder	
1 Classian as 103 portuge traces	2191111
1 Coleman powermate 2250 wat green or the	11001
	
1) WORK ACCOMPLISHED TODAY:	
1130 - arrive at well # & + bogin softing up	
	: 4.52
FID bippers: b. &FH 1 cal spen-pot at:	6.02
	2011
	2011
ppm = 10	
	7 6 X <-30" Hg
FID bypes - 2650 ce/min. ppm - 6.8	
Pump by pass: 225 capin, #6 box: 20.	7.50 CF
1345 - 1 - spon FID - spon roding was 950 and	- small back to 850mm
etemp out soling 4.44	
40.4	1-20"11
1350 sample taken in cylinder 746, 740	er 50 Hg
FID topass = 2650 cc/min gas = 0.4	
pumpetings = 450 cc/min 60x = 2/7.	9 05
1400 - 40 of sample line disconnected from F	ID- allow well to recover
Was the FID - at I UT your FID - o	pl at 4.38
ETD #	m = 1 to = all all a cain
15/7- 19 CM All All All C	of the difference
- Adjaconnet John Will Allow will without well	every.
1610 - Acoust FID to will, the pump on 1711	3.1.7
Sounds collected in cult P-43 P-53 at 5-30	144
	- 1
ETD MOTH : 2650 almin PAM = 1.	7 ⁻
PM = 1.	29.6 CF

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FORM 21C

	= '	PROJECT NO	SACZ877	ZZ.03.
DAY:	DATE: 033091 WORK PERIOR	A.M. TO	.M. REPORT NO.	
WEATHER	TEMP. MAX°F: MIN°F: I	PRECIPITATION		
NUMBER AND CL	ARD OF PERSONNEL EMPLOYED:			
	MAJOR EQUIPMENT ON PROJECT	AND AMOUNT OF USE	SIZE/CAPACITY	HRS. OPER
NO.	DESCRIPTION		SIZE/CAPACITY	HAS OPER
				<u> </u>
			 	
				1
Law fl	low drawdown ? reco		MW *7	
Law fl	New Box # 6 reading		MW *7	
	New Box # 6 reading		MW *7	
Law fl @15:02	New Box # 6 reading FID = 65cfh Bypass = 0.48	= 97.7 cf	MW *7	
Law fl @15:02	New Box # 6 reading FID = 65cfh Bypass = 0.48 Box 6 reading = 10	= 97.7 cf	•	
Law fl @15:02	New Box # 6 reading FID = 6 scfh Byrass = 0.48 Rox 6 reading = 10 THC concentration	= 97.7 cf	•	
Law fl @15:02	New Box # 6 reading FID = 6 scfb Bypass = 0.48 Rox 6 reading = 10 THC concentration FID = 6 scfb	= 97.7 cf	•	
Law fl @15:02	New Box # 6 reading FID = 6 scfh Byrass = 0.48 Rox 6 reading = 10 THC concentration	= 97.7 cf	•	
Law fl @15:02 @16:16	New Box # 6 reading FID = 6 scfh Byrass = 0.48 Rox 6 reading = 10 THC concentration FID = 6 scfh Byrass = 0.48	= 97.7 cf b.9 cf c = 440 pp	•	
Law fl @15:02	New Box # 6 reading FID = 6 scfh Byrass = 0.48 THC concentration FID = 6 scfh Byrass = 0.48 Byrass = 0.48	= 97.7 cf b.9 cf c = 440 pp		
Law fl @15:02 @16:16	New Rox # 6 reading FID = 6 scfh Bypass = 0.48 THC concentration FID = 6 scfh Bypass = 0.48 Bypass = 0.48 THC concentration	= 97.7 cf b.9 cf c = 440 pp		
Law fl @15:02 @16:16	New Box # 6 reading FID = 6 scfh Bypass = 0.48 Pox 6 reading = 10 THC concentration FID = 6 scfh Bypass = 0.48 Box 6 reading = 1 THC concentration FID = 6 scfh THC concentration	= 97.7 cf b.9 cf c = 440 pp		
Law fl @15:02 @16:16	New Rox # 6 reading FID = 6 scfh Bypass = 0.48 THC concentration FID = 6 scfh Bypass = 0.48 Bypass = 0.48 THC concentration	= 97.7 cf b.9 cf c = 440 pp		
Law fl @15:02 @16:16	New Box # 6 reading FID = 6 scfh Bypass = 0.48 Pox 6 reading = 10 THC concentration FID = 6 scfh Bypass = 0.48 Box 6 reading = 1 THC concentration FID = 6 scfh THC concentration	= 97.7 cf b.9 cf c = 440 pp		
Law fl @15:02 @16:16	New Box # 6 reading FID = 6 scfh Bypass = 0.48 Pox 6 reading = 10 THC concentration FID = 6 scfh Bypass = 0.48 Box 6 reading = 1 THC concentration FID = 6 scfh THC concentration	= 97.7 cf b.9 cf c = 440 pp		

	122201	PROJECT NO. SAC 287	
	DATE: 0.31309.L WORK PERIODIC	•	٠
WEATHER	TEMP. MAX°F: MIN°F: PRSCI	IPITATION	· · · · · · · · · · · · · · · · · · ·
NUMBER AND C	LASS OF PERSONNEL EMPLOYED:		
	MAJOR EQUIPMENT ON PROJECT AND		
NO.	DESCRIPTION	SIZE/CAPACITY	HRS. OPE
	· · · · · · · · · · · · · · · · · · ·		
	<u> </u>		
Initia Bypas	ng time-10:41 1 Box #6 reading = 404.5 5 = 0.9	र्ट	
	e #1 taken at 10:53 @		
a 12:17	Box 6 reading = 410.4 a	cf	
	Bypass = a.90		
	TAC concentration = 12	20 ppm	
	Span reading = 830 p		
	Reset FID 0		
	Sample reading = 140;	ppm	
@12:37	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Scf	
	9		
A) 10 .00	. Box # 6 reading = 421.6	ct	
0 13.22			
13.77	Bypass = 1.0		
13.77	THE concentration =	140ppm	

DAY:	DATE: 0.3	2.59.1	WORK PERIOD	244 A TO	454 245 RE	PORT NO	
	TEMP. MAX			RECIPITATION.			
	LASE OF PERSONNEL						
	۲		***	•			
NO.		R EQUIPMENT DESCRIPTION	ON PROJECT A	ND AMOUNT (APACITY	HRS. OPE
			···				
	<u> </u>						
- -		·····	<u> </u>				
							
							<u> </u>
Taital	reading o	m #4 L	3	74 4 45			
Total	ow drowded	n #6 b	00x - 3	74.4 cf		 	
Bupass	= 0.4 0		 				
Bupass	= 0.4 0		 				
Bupass	= 0.4 0		 				
Bupass FID = 6 Total	= 0.4 0		 				
Bupass FPD=6 Total @ 1654	= 0.4 0	on (THC)) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo	= 0.4 scfh hydrocorbo x reading =	on (THC)) concen				
Bupass FPD=6 Total @ 1654 # 6 Bo	= 0.4 0 scfh hydrocorbo	on (THC)) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID =	= 0.4 scfh hydrocorbo x reading = ss = 0.40 b scfh	382 67) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID =	= 0.4 scfh hydrocorbo x reading =	382 67) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID = THC	= 0.4 scfh hydrocorbo x reading = ss = 0.40 b scfh concentrat	382 67) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID =	= 0.4 scfh hydrocorbo x reading = ss = 0.40 b scfh concentrat	382 67) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID = THC	= 0.4 scfh hydrocorbo x reading = ss = 0.40 b scfh concentrat	382 67) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID = THC	= 0.4 scfh hydrocorbo x reading = ss = 0.40 b scfh concentrat	382 67) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID = THC	= 0.4 scfh hydrocorbo x reading = ss = 0.40 b scfh concentrat	382 67) concen				
Bupass FID = 6 Total @ 1654 # 6 Bo Bupo FID = THC	= 0.4 scfh hydrocorbo x reading = ss = 0.40 b scfh concentrat	382 67) concen				

		- 200
DAILY INSPECTION DIARY	PAGE OF	
	PROJECT NO.	<u>. </u>
(1)DAY: DATE: 4 1 1 9 1 WORK PERIOD		
		0
WEATHERTEMP. MAX°F: MIN°F: PRECI	PITATION	
(2) NUMBER AND CLASS OF PERSONNEL EMPLOYED:		
		
		·
(3) MAJOR EQUIPMENT ON PROJECT AND		
NO. DESCRIPTION	SIZE/CAPACITY	HRS. OPER.
(4) WORK ACCOMPLISHED TODAY: Moved to Went	Riser 3-9	
Multi-Media		
Span & Cal.		
Leak Check 13:55		
Started Blans 13:57		
Z.2 DDM.		<u> </u>
	1 /hno & C = 10	
	1 (00)	/
0/2 00m		VC
Sta . 1 Ch - 7 nd Pulp at 11:31	1 loop con El	
Sioney 2 Fun at 19.01	lang, can	7.
() /2 22		
SHIP 2 Va Z. CHILL	1.67	
Stable 5 Nun 41 1-	- J	
		
		
		-
		

DAKAI	SPECTION DIARY		PAGE	OF	7.3
,		•	PROJECT NO	SAC 2878	22.03.
DAY: £	DATE: 8.41	P. T.L. WORK PERIOD_	A.M. TO	I.M. I.M. REPORT NO.	
		F: MIN°F: PREC		_	
	ASS OF PERSONNEL EMPL				
					
		DUIPMENT ON PROJECT AND	AMOUNT OF USE		
NO.	•	ESCRIPTION		SIZE/CAPACITY	HRS. OPEI
FID	Z U HAUL				
	•				
		······································			
				 	
				<u> </u>	
WORK ACCOMPLIS	HED TODAY:	儿 # 3-5			
	0 0 10:23				
10-110/2	20/2 10:11				
Leak (I)	pressure Ou				
alleans	pressurecu	ecked			
	•				
Stacked	Blanks at	10:50			
SMITH	Dianes as		-		
		· · · · · · · · · · · · · · · · · · ·		 	• •
<u> 11.3 pp</u>	m				
• •					
Failed	Run II 1 a	F /1:01 (ha	a $5m$ $5a$	n, ESM	NA C
) 		
0100			-		
0.1pp	NA I				
Strate	+ Run # 2	at 11:25(bag, sm.ca	IN F SM D	es. Can
		()		
012	7.40				
9.1 pt	ויאָעָן				
	 				
	Run#3	at 11:49	lba.c	m.con	7
Starte					
Starke		, •	J' -	•	
Starte			<u> </u>	•	<u> </u>

	NSPECTION DI	ARY	1	PAGE	/	
				PROJECT NO		
		41.09 H WORK				
REATHER	TEMP. MAX .	°F: MIN°F:	PRECIPIT	ATION		· · ·
IUMBER AND CL	ASS OF PERSONNEL	. EMPLOYED:				
						
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	•					
		JOR EQUIPMENT ON PR	OJECT AND AM	21187 05 1165		
NO.		DESCRIPTION	COECT AND AM	JUNI UP USE	SIZE/CAPACITY	HRS. O
F10 4	U HAJC					
				<u> </u>		
IORK ACCOMPLIS	SHED TODAY:	VR 3-4	SAMICIN	<u>~</u>		
4.11.		20 (0,2-			1 017 7	
HIICA	ns ar -	-30 (PIZ	PIC	-4, PII	8 1 PIC 2	
		- -				
- 7 - 1	1 1	at 14:([)			_
Leak	check !					
Leak	chick of					
Leak	chuk d Ks at	14:14				
Leak Blan 25,0 pm	chuk o	14:14				
Leak Blan 25 pm Start	check of Ks at Run =	14:14 # 1 at	14:	20	(bao) c	lup
Blan	Ks at Run =	14:14 #1 at	14:	2.0	(bagic	lup
Blan 25 pm Start	·) \ \ -	14:14 #1 at	14:	2.0	(bag c	lup
Blan 25 pm Start	·) \ \ -	14:14 #1 at	. 14:	20	(baoj c	lup
Blan 25 pm Start)/1		14:		0	Ιυρ
Blan 25 pm Start	·) \ \ -	14:14 # 1 at # Z at	14:		(bagic	lup
Blan 25 pp Start 1.5 pp	Run #		14:		0	lup
Blan 25 pm Start	Run #		14:		0	lup
Blan 25 pp Start 1.5 pp	Run #	† Z at	14 4 3	- (no	0	lup
Blan 25 pm Start 1.5 pp Start 1.5 pp	Run #	† Z at	14:	- (no	0	lup

PATE

DAILYIN	SPECTION DIARY	PAGE	.07	
	0.1	PROJECT NO	•	
DAY:	DATE: 64 1 D 9 1 WORK PE	RIODP.M. TO	A.M. REPORT NO.	
	TEMP. MAX °F: MIN °F:	PRECIPITATION		
NUMBER AND CL	ABS OF PERSONNEL EMPLOYED:	•		
	MAJOR EQUIPMENT ON PROJE	CT AND AMOUNT OF USE		_
NO.	DESCRIPTION		SIZE/CAPACITY	HRS. OPE
-	· · · · · · · · · · · · · · · · · · ·		 	
			 	
				
	HED TODAY: EVERTHESC	26-1		<u> </u>
WORK ACCOMPLIS	check at 1155	V. V.	•	
0.11	ans at -30 /P-11	1, DIO6, D99	PIDL	DIII
			, , , , , , , , , , , , , , , , , , , 	
Start	ed Blanks at 12:	10	_	
				•
38pp	<u>n</u> .			-
Starte	d 1st Run at	12:16	andy	<u>)) : </u>
£ 2 ~~			<u> </u>	
Pabb	m and D	12.20 /	h a d	-
Start	ed 2 Kun at	16.30	no du	٠,٠
2,26	om and p	12:00	na d. 0	-
	ta 5 kun al	13.00	nodup	/
				
				
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	RESIDENT'S SIGNATURE		PATE	

DATE OF THE PROPERTY OF THE PR	1. 0.411.019.41 wo	RK PERIOD A.M. TO_		
WEATHER WINDY TEM	P. MAX °F: MIN		_	
NUMBER AND CLASS OF PER			•	
	MAJOR EQUIPMENT ON	PROJECT AND AMOUNT OF		
NO.	DESCRIPTION		SIZE/CAPACITY	HRS. OF
FID & UHA	<i>.</i>			
1				
				1
		<u> </u>		
				
				<u> </u>
WORK ACCOMPLISHED TODAY	v: 1 VR 4-	2 MULTIME	DIA	
SPAN & ZERO				
All cansa	t -30 (#P-7	9. P-90 P-10	D. P.95)	
	anks at 9	16		
Stantal KI				
Started Blo	amin an I	.13		
Started Blo	an I	.13		
		1.25		;
Started 1st		1.30 , (bag)	dup)	, 1:2 p
	Pun at -0	1.25	dup.)	, 1:2 p
Started 1st	Pun at -0	0/0ps of a	bout 9:35	; :2 P
Started 1st anna shut down	Pun at - 0 for ran out	1.30, (bag)	bout 9.35	; :2
Started 1st anna Shut down Jeanne Moore	Pun at - Co for ran out a for appro-	1.30, (bag)	bout 9:35	; :2 p
Started 1st grue Shut down Jeanne Moore 9:45 t	Pun at -0 for ran out a for appro- and another 1	1.30, (baa) of oas at a ox 60 sec AF employee on	bout 9.35	;;z _P
Started 1st anna Shut down Jeanne Moore	Pun at - Cor ran out and another 10.00	1.30, (bag)	bout 9.35	, , , , ,
Started 1st grue Shut down Jeanne Moore 9:45 t	Pun at -0 for ran out and another of 10:00 run at	1.30, (baa) of open at a ox. 60 sec Af employee on	bout 9.35	1:2 p
Started 1st amusa Shut down Jeanne Moore 9:45 t Started 2nd	Pun at -0 for ran out and another of 10:00 run at	1.30, (baa) of open at a ox. 60 sec Af employee on	bout 9.35	0 PF
Started 1st grue Shut down Jeanne Moore 9:45 t	Pun at -0 for ran out and another of 10:00 run at	1.30, (baa) of oas at a ox 60 sec AF employee on	bout 9.35	0 PC
Started 1st anna Slut down Jeanne Moore 9:45 t Started 2nd Rangut	Pun at -0 for ran out and another. I 10:00 run at of strip ch	1.30, (bag) of open at a extra 160 sec Femployee on 10.05 (no a nant paper	bout 9:35. site from lup.) 1.	0 PF
Started 1st gruend Shuf down Jeanne Moore 9:45 t Started 2nd Rangut	Pun at -0 for approand and another. I 10:00 run at 1 of strip ch	1.30, (baa) of open at a ox. 60 sec Af employee on	bout 9.35	0 PF
Started 1st gruend Shuf down Jeanne Moore 9:45 t Started 2nd Rangut	Pun at -0 for approand and another. I 10:00 run at 1 of strip ch	1.30, (bag) of open at a extra 160 sec Femployee on 10.05 (no a nant paper	bout 9:35. site from lup.) 1.	0 PF
Started 1st gruend Shuf down Jeanne Moore 9:45 t Started 2nd Rangut	Pun at -0 for approand and another. I 10:00 run at 1 of strip ch	1.30, (bag) of open at a extra 160 sec Femployee on 10.05 (no a nant paper	bout 9:35. site from lup.) 1.	0 PF
Started 1st gruend Shuf down Jeanne Moore 9:45 t Started 2nd Rangut	Pun at -0 for approand and another 10:00 run at 1 of strip ch	1.30, (bag) of open at a extra 160 sec Femployee on 10.05 (no a nant paper	bout 9:35. site from lup.) 1.	0 PF
Started 1st gruend Shuf down Jeanne Moore 9:45 t Started 2nd Rangut	Pun at -0 for approand and another 10:00 run at 1 of strip ch	1:30, (bag) 01.000 at a 0x. 60 sec 10:05 (no a 10:05 (no a 10:50 0.7	bout 9:35. site from lup.) 1.	0 PP

QAY:		•				
A-1.		9194	iAli - AM	OJECT NO.	•	
WEATHER			P. N			, -
	TEMP. MAX	\mathcal{A}	PRECIPITAT	ION	<u> </u>	
NUMBER AND CLASS	B OF PERSONNEL EN	PLOYED:				
						
	1					
	MAJOR		ROJECT AND AMOU	NT OF USE		
NO.		DESCRIPTION	· · ·		SIZE/CAPACITY	HRS. OP
			· ·			
					ļ	
						
NORK ACCOMPLISHE	ED TODAY:	Hent Ris	er 4-4	MuH	Media	5
		————————				
Finished	plants	at 13'	4/			
i made	piaras		' 7U			
Can P. 8		- 7A				
Lan Pa	TO at	_30				
-1-1-1		4 1	1250			
Startd	Kun#	<u> </u>	13.58			•.
						
Can P-	5:1 at	-30_			<u> </u>	
					į.	
Started	Run #	Zat	14:23)		
Can P-	85 at	· 30				,
				<u> </u>	•	
Sterles	Pun	#3 c+	14:44			
		,				
Enclud	Sampli	110 150	<u> </u>			
FILLSING	Sampin		<u> </u>			
				 -		
		•				
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(B)

RESIDENT'S SIGNATURE

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, , , , , , , , , , , , , , , , , , ,	40991 AUG. 80	All management	
, M	SATTION PRECIPITATION	• 7 - 7	
(2) N	UNIDER AND CECTATION PERSONNEL EMPLOYED:		;
/ -		<u> </u>	
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(3)	MAJOR EQUIPMENT ON PROJECT AND AMOUNT OF USE 10. DESCRIPTION	SIZE/CAPACITY	HRS. OP
Ī	FID & UHAUL		
	•		
L			
L			
(4) W	ORK ACCOMPLISHED TODAY: # WEDT RISER 4-3 MUC	TI MEDIA	SAUR
•		ن الله الله الله الله الله الله الله الل	*
-	Took Blanks (sm. can & bag) at	1:00	1 .
_		- 10	<u> </u>
_	Pressure on cans. P-98 and P-8	7 0+ -5	20
_			
4	Started Run # 1 at 11:27 (Candu	P.	**
	Bag and not fill, restarted at	11:50	·
	0 707 1 30		
_	Can P93 at -30.	:	-
_	01 to 1 12 12 12 12 12 12 12 12 12 12 12 12 1	and: a	
_	July Turi Hz. at 15.00	ag diep	J
_	0.05		7
	Can	1 6 - 1 · 1	
-	SA- 17:31-		
		and the	
			2007 2003
-	The state of the s		<u>.</u>
_			91 <u>,5</u> 2 ×
			,
-		1 de la companya del companya de la companya del companya de la co	
	•	DATE	
	(0.1) <i>i</i>	-	FORM

PROJECTION DIAGRAM		
118AW DATE: 0.4 0 8 9 1 None 1000 TO	A.M. DESERVANT MO	
WEATHER THE MAX F: MIN PRECIPITATION		
2) MANBER AND CENTRAL PERSONNEL EMPLOYED:		
PERSONNEL EMPEOTED.		
·		·· ···
		
MAJOR EQUIPMENT ON PROJECT AND AMOUNT OF USE		•
NO. DESCRIPTION	SIZE/CAPACITY	HRS. OPER
		<u></u>
WORK ACCOMPLISHED TODAY:		T.11 =
	ns on MW	升5
and for la can an 1st run of MW) #	÷
J	T 1	
Cans P-77 and A V/36 at -31		
4		
Pump # 10099 usto tibe 1000 time, w/	L	
Pump # 10099 who tribe 1000 thin w/	1 1 .	5. 75a
		s/m.
- Post So	imple 80)cc/m
Start Run #2 at 14:30	·	. *
		:
Cans # P91 and AV094 at F31		
	-	
Pump 39 w/o tube 100 calmin wh	Libe # 202	7 85
Pump 100 tube 100 calmin w	100	7
- Ca	40 100 C	INI
Port	Sample s	75 cc/
Sart 3 at 14:59 Recal	wo tobe	e to
100	cc/min	<u>i</u>
Pi- 31	THE STEEL V	
		-
	3.4 34/11	75
	15: 14 /	/
PERIORNY'S SIGNATURE	DAYE	

(8,1)

	Property	
(1)DAV:	DATE: 0.410.819.11 WOOD TO THE TOTAL PROPERTY OF THE PARTY OF THE PART	TOA.S. REPORT NO.
(2) NUMBER AND CLA	OF PERSONNEL EMPLOYED:	
	11-	
~~	•	
(3)	MAJOR EQUIPMENT ON PROJECT AND AMOUNT	OF USE
NO.	DESCRIPTION	SIZE/CAPACITY HRE OPE
4) WORK ACCOMPLISH		
For run		
Pump	10099 - for titer 2018 on bi	was tube - too to
		w/tobe - 60°c/mir
	calibrated w/tu	be-100 cc/min
00	to mentorus Well #4	post samble
Moved +	P-86 FEOZZIQ+ 30.	100 cc/m
Start	ed blanks a 13:15	
(+7	ibistarted at 13:28	18
Cans Al	22 and 782 at -30.	
Cans Air	the ana PAZ av Jo	
Pump	a w/o. tube 100cc/min.	with tube # 2020
	io	55 cc/min, recal
		to loore min.
Started	Run # 1 at 13:59	Ost Sample at 70 cc/M
Harka	Igcan. Inc	
Tat au	age was possibly losse, tighte	ened at 14.70
))		DATE
	PESIGENT'S SIGNATURE (8.1)	FORM 2

NEATHER		TO MINE	PRECEN	The Transfer		Se and a serve
NUMBER AND C	agracomet.	EMPLOYED:		7A11GN	The state of	• .
		<u>·</u>			· 1	
		-	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	+
	MAJO	R EQUIPMENT ON	PROJECT AND AL	AQUINT OF USE	SIZE/CAPACITY	HRE OF
NO.		DESCRIPTION	······································		SIZE/CAPAGITY	- mas u
				1		+
	<u>. </u>		\			1
			1.	* \	.*	
				18	5	
NORK ACCOMPLI	INHED TODAY:	Same and the	11. 5 Est	1.0	M. M.	3
lecal	pump 10	Dag with	but tul	e.to	DO COLOR	4
- Pumo	10099 WH	h tube #	2005 w	5500/L	WIN , The	4
77	inneclm	in Pos	T SAMPL	LCAE	100	Sie
				- 4	***	pai may
Cans	D-7/2 8	AUIA5	ation 39	AS 11	-	•
				Transmitted to the second		
		7				Party.
1.47	pm					Park .
1.47	pm				6	
1.47 Starte	pm d Rings	Z. 1/: 1/	S		6	
Starte	opm d Rings	Z 1/1				
Starte Pump	d Ranget	Z IF L				
Starte Puma recal	d Ranget	Z IF I				
Starte Pum recal	d Rings	2.				
Starte Pum recal Cans	A Kungt	the trade	5			
Starte Pum recal	A Runat	the be	4 .31			
Starte Pum recal	A Raincate	the be	4 . 31 H 64			
Starte Pum recal Cans Starte	A Ringt	2 It I	4 3 H			
Starte Pum recal Cans Starte	De 99	the trade	4 . 31 14 . 64 24 . 66			
Starte Pum recal Cans Starte	A Ringt	2 It I to be 1 TB	4 3 4 6 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6			
Starte Pum recal Cans Starte	A Ringt	7 A tula	# 3 H 6 A			
Starte Pum recal Cans Starte	A Kuncit	the beautiful to the second se	4 3 H			

				27 45 2	$\overline{}$
) DAY		ALC A LA	1. 9:00 - "	A.M.	•
·····		A LOS LA	- N.W. 10	AMPI PERFORMANCE	
WEATHER.	THE MAX	F: MIN	PRECIPITATION		
)NUMBER A	MO CLASSIC PERSONNEL	EMPLOYED!			(
				~	\
			· · · · ·		
					<u> </u>
	MA.	JOR EQUIPMENT ON PROJEC	T AND AMOUNT OF U		
NO.		DESCRIPTION		SIZE/CAPACITY	HRS. OPE
F	18				
					1
<u> </u>	LYMANTOL				
					1
					
	 				
MORK ACC	ONFLISHED TODAY:	MUCTI MEDIA	SAMPLIAN D	AL MARKET	5
WONN	Contract Took I.	CASSIL RECORD	1		\$.
	<u></u>				Y
Pump	10099 -	orifice for	MW-T-0-3	5-8 callb	Etech
7		•	i e	• • • • •	-
		04 100 ce 10	ND W/o CO	rpon man	
	• •	and the		4	
	<i>/</i> ^	10/ miles	coshon the	26 3E36	- cc/
		W/prilearles	carbon #	-35-3	cc/m
		و معامدته	carbon #	-35-3	ec/m
Star	+ Blanks	9:59	carbon #	35-3	ec/m
Star	+ Blanks	و معامدته	carbon #	-35-3	k ec/m
Star	`	9:59	1 marine	38-39	
Star Pump :	`	9:59	1 marine	E NA TEL	
Star	CAL "48 cc	و معامدته	1 marine	E 111 + 111	
Star Pump	`	9:59	1 marine	The second second	, 77 (4
Star Pump	CAL "48 cc	9:59	The second	E NJ * E	777
	05 cc/	9:59 will w/ CHARCO!	The second	The second second	777
Can	105 cc/s	9:59 will w/ CHARCO!	The second	The second second	777
	105 cc/s	9:59 will w/ CHARCO!	The second	The second second	777
Can	105 cc/s	9:59 will w/ CHARCO!	The second	The second second	777
Cans	105 cc/s	9:59	The section was	The second second	7774
Can	105 cc/s	9:59	The second	The second second	1 77 (4
Cans	105 cc/s	9:59	O. CE/min	The second second	7774
Cans	105 cc/s	9:59	O. CE/min		7774
Cans	105 cc/s	9:59 9:59 9:59 1:13 of -3 1:19 pp m	O. CE/min		7 7 14
Cans	105 cc/s	9:59	O. CE/min		7774
Cans	105 ces	9:59	O. CE/min		7 7 14
Cans	105 cc/s	9:59	O. CE/min		7 7 14
Cans Init Pump Star	CAL 48 cc/s 105 cc/s Run #I (also running)	9:59	O. CE/min		7 7 14
Cans Init Pump Star	CAL 48 cc/s 105 cc/s Run #I (also running)	9:59 	O. CE/min		1
Cans	CAL 48 cc/s 105 cc/s Run #I (also running)	9:59	O. CE/min		r i
Cans Init Pump Star	CAL 48 cc/s 105 cc/s Run #I (also running)	9:59	O. CE/min		, (A)
Cans Int Pump	CAL 48 cc/s 105 cc/s Run #I (also running)	9:59 	O. CE/min		, (A)

بتحتن	New York	MAX°F: MIN°F:	PRECIPITATION	P. M. REPORT NO	
) NUMB	ER AND CE	SONNEL EMPLOYED:			
•					
NO.	,	MAJOR EQUIPMENT ON PROJECT	T AND AMOUNT OF	SIZE/CAPACITY	HRS. OPE
		-			
					1
					
٠,٠					
St	ad #3 r	30 - 21			<c m<="" td=""></c>
<u></u>	n P.66 -3 AVIIZ	unat 14:22	100 CC/mm		<c m<="" td=""></c>
<u></u>	n P.66 -3 AVIIZ	unat 14.22 STALF CAL TO	100 CC/mm		, <c pa<="" td=""></c>
<u></u>	n P.66 -3 AVIIZ	unat 14.22 STALF CAL TO	100 CC/mm		<c m<="" td=""></c>
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<u></u>	n P.66 -3 AVIIZ -	unat 14.22 STALF CAL TO	100 CC/MW		
<u></u>	n P.66 -3 AVIIZ -	unat 14.22 STALF CAL TO	100 CC/ma		

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FORM 21C

1044	10.619.11 WORK PERIOD 10 5	ROJECT NO		<u> </u>
WEATHER CL DY TEMP. MAX	_	TION	REPORT NO.	
NUMBER AND CLASS OF PERSONNEL	•	110M		
MA.	DO FOLLIMATING ON SOCIETY AND ALLOW			
NO.	OR EQUIPMENT ON PROJECT AND AMO DESCRIPTION		SIZE/CAPACITY	HRS. OPE
				
		+		<u> </u>
				<u>_</u>
WORK ACCOMPLISHED TODAY:	MW #6 MULTI-M	LDIA		
				34
LAND OILLAND A H				
LEAK CHECK O.K				·
P-67 = - 30 with				
P-67 = - 30 IN HS	Ha			
P-67 = - 30 with	Ha			
P-67 = -30 WH3 AV ONG = -30 WH3 BLANKS RUN @	Ha	•		
P-67 = -30 IN H3 AV OK6 = -30 IN H3 BLANKS RUN @ P-61 = -30 In H9	Ha	•		
P-67 = -30 WH3 AV ONG = -30 WH3 BLANKS RUN @	Ha	· · · · · · · · · · · · · · · · · · ·		
P-67 = -30 IN Ha AV OK6 = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha	H3 12:31			
P-67 = -30 IN Ha AV OK6 = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha Pump # 10099	Ha 12:31 calibrated at 10			
P-67 = -30 IN Ha AV OK6 = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha Pump # 10099	calibrated at to	7+ 98c	=/min	
P-67 = -30 IN Ha AV OK6 = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha Pump # 10099	calibrated at to after blank run a	t 98cc	=/min	ce/mir
P-67 = -30 IN H3 AV ONG = -30 IN H3 BLAINES RUN @ P-61 = -30 IN H9 AV103 = -30 IN H9 Pump # 10099	calibrated at to after blank run a	t 98cc	=/min	cc/mir
P-67 = -30 IN H3 AV ONG = -30 IN H3 BLAINES RUN @ P-61 = -30 IN H9 AV103 = -30 IN H9 Pump # 10099	calibrated at to after blank run after blank run a	t 98cc	=/min	cc/mir
P-67 = -30 IN Ha AV ONG = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha Pump # 10099	calibrated at to after blant run both orifices cal	t 98cm	=/min	cc/mir
P-67 = -30 IN H3 AV OK6 = -30 IN H3 BLANKS RUN @ P-61 = -30 IN H9 AV103 = -30 IN H9 Pump # 10099	calibrated at to after blank run both orifices cal br sampling run	t 98cc	at 100	
P-67 = -30 IN Ha AV OK6 = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha Pump # 10099 Sampling Fum A Pump # 10099	calibrated at to after what run after what run after what run aboth arifices callor sampling run at 13 at 105 cc/min	t 98cc	at 100	
P-67 = -30 IN Ha AV OK6 = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha Pump # 10099 Sampling Fum A Pump # 10099	calibrated at to after blank run both orifices cal br sampling run	t 98cc	at 100	
P-67 = -30 IN H3 AV OK6 = -30 IN H3 BLANKS RUN @ P-61 = -30 IN H3 AV103 = -30 IN H3 Pump # 10099 F Sampling Fum A Pump # 10099	calibrated at to after blank run both orifices cal br sampling run 21 started at 13 9 at 105 cc/min	t 98 co	at 100	t to
P-67 = -30 IN Ha AV OH6 = -30 IN Ha BLANKS RUN @ P-61 = -30 IN Ha AV103 = -30 IN Ha Pump # 10099 Formal From A Pump # 10099 Sampling run	calibrated at to after when the refress call both arifices call both arifices call at 13 at 105 cc/min occ/min	t 98 co	at 100	t to
P-67 = -30 IN H3 AV OK6 = -30 IN H3 BLANKS RUN @ P-61 = -30 IN H3 AV103 = -30 IN H3 Pump # 10099 F Sampling Fum A Pump # 10099	calibrated at to after when the refress call both arifices call both arifices call at 13 at 105 cc/min occ/min	t 98 co	at 100	t to

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		4 13 V	PROJECT		
	DATE: [0,4] 3,4				
	TEMP. MAX°F:		PRECIPITATION		
NUMBER AND CL	ASS OF PERSONNEL EMPLOY	/ED:		į	
			 .		
NO.	 	IPMENT ON PROJECT SCRIPTION	AND AMOUNT OF	SIZE/CAPACITY	HRE OPER
	:			SIEDON ASITY	
	· · · · · · · · · · · · · · · · · · ·				
	· · · · · · · · · · · · · · · · · · ·				
					<u> </u>
VORK ACCOMPLE	BHED TODAY:			To the Argentine	
#2 50	t of Samples	5	•	· T 3	j
	. can # AV 400				<u></u>
Sir	.can #.P-57	<u>at -30</u>	PSI		·
Also r	unning 2 cho	ircoal to	bes in	series	
· (bo	the collect	NW-T-0-	9-Z: mar	ked 12 + 2nd	u senes
				44	
Star	led at.	12:15	Jean Moor	E INSPECTED	BITL A
		•	•	0 3	
after s	sampling ou	mo # in	99 Still 0	+ Horcelmi	n
reca	1 +0 100	ce/min .		The second second	
			······································		
t3 cot	of sample	?<	•		·
	TO THE PLANT	70+ - =	१००६		
	The +0 cd	L 20	~	<u> </u>	·
<i>D</i>	THE POP OF	21.0	ما بعد معم عوداء	ac in Canida	•
Kunn		aup , , r	running tun	es in Series	·
Start	ea at 13:0	*	105	D	<u> </u>
<u> calibr</u>	ated pump	10107 to	900 ce (min Prior	τυ
calibi	ration it wa	<u>is 1020 i</u>	cc/min	1	was
ox 101	50 cc/min a		t somblio	\	-
Pum	10099	at 100 cc	/min att	er sample	9
y - •	· · · · · · · · · · · · · · · · · · ·	T'S SIGNATURE	•	·	, , , , , , , , , , , , , , , , , , ,

The state of the s	CONTRACTOR DEADLE	PA	œ(
·	. •		OJECT NO		
	DATE: 0.410.419.1				
WEATHER	TEMP. MAX°F: MIN	°F: PRECIPITAT	10N		
NUMBER AND CL	ALE OF PERSONNEL EMPLOYED:				
				.4	
					
) (MA WAS SOURCES	N PROJECT AND AMOU	NT 07 1105		
NO.	DESCRIPTION		NT OF USE	SIZE/CAPACITY	HRS. OPE
P FID	JUM VE-7		**		
	AL TRAILER				
					
<u> </u>					
	HED TODAY: MW #9				
FID WA	em up start e b:7	<u> </u>	TARL	T e 9:5	<u> </u>
PRESSUEIZ	ed system to 10 PS	1 & SMOOPE	FOL L	LAKS	
BLANKED	WITH No				
Starte	a Blanko at 10	25			
Both	cans at -300	i - 3			
	3-580 FAX 0		TO	HARLES 1	THORPE
	Thorpe & Jeanne Mo				
. 1 4	t of samples			<u> 11 00</u>	
	. can AV 039 at	\$ 30 051			
SX	can P-58 at	≥ -30ps			
<u> </u>	1. can P - 43 a	L - 30 25		· · · · · · · · · · · · · · · · · · ·	
Gilian	Dumo # 10099	- 30 ps		eo Imir	1
	Mamp 1 10044		FUC	es prin	<u> </u>
24					
<u> </u>	0 t 11:20		<u> </u>		
Stark	11.59	411 = 40	<u> </u>		
		NW -AC-C-	9-1	1	
		W - AC - C -	9-4 (0	lup ot at	20ve.
	at 11:45	•			
	·				
After s	ampling Dumn #	= 10099 at	- 110	cclmin	
ceco		in			
	RESIDENT'S SIGNA	ATURE	DA	78	

		PROJECT NO	.	
DAY:	DATE: WORK PERIO	00 - A.M. TO	_A.M. REPORT NO.	
MEATHER	TEMP. MAX°F: MIN°F:	PRECIPITATION		
NUMBER AND C	LASE OF PERSONNEL EMPLOYED:			
			-	
				
				•
	MAJOR EQUIPMENT ON PROJECT	AND AMOUNT OF I		
NO.	DESCRIPTION	AND AMOUNT OF U	SIZE/CAPACITY	HRS. OP
1.				
VORK ACCOMPL	•	· · · · · · · · · · · · · · · · · · ·	· / 1 / 2 - 3	·
#3 Sc	amples,	, , 		
عله	so taking a pressurize	la can	•	
<u> </u>				
AVOL	18 reading less than	- 10 PSI	replace	d.
	with can # AVI	23 which	reads - 30	124
Other	cans reading -30 Ds	<u> </u>		• (
		`		
- $5tc$	art 12.52			
	80ppm			
<u> </u>				
<u> </u>	I pressure on pessur	ized can	Z6P	SI
<u> </u>	× .			
			 	
		<u> </u>		
			3	
		1	<u> Dag : : · · · · · · · · · · · · · · · · · </u>	•
£'^				
				
	RESIDENT'S SIGNATURE		DATE	

(8.1)

FORM 21C

DAILY INSPECTION DIARY	or	- Charles
· ·	OJECT NO.	• **
(1) DAY: DATE: D.4 O. 3 9 1 WORK PERIOD 8	A.M. 272027	
WEATHER CLEAR TEMP. MAXOF: MINOF: PRECIPITATE		
(2) NUMBER AND CLASS OF PERSONNEL EMPLOYED:		
_		
BARRY COLLUM		
SUZANUE DAVIS	•	
KARLA EBERT		
ROBERT KOSTER		
(3) MAJOR EQUIPMENT ON PROJECT AND AMOU	INT OF USE	
NO. DESCRIPTION	SIZE/CAPACITY	HRE OPER.
I JUM UE -7 TOTAL HYDROCARBON ANALY?	ecs	
(4) WORK ACCOMPLISHED TODAY: MULTI-MENIA SAMPL		
Start Blanks 10:45 .		
#1 set of samples .		
also running la can pressi	uri 200'.	
all cans at -30 DS.		
160 pp m		
Start at 11:28	t.:	
pres can ending pressure - ?	26.5 lbs +	
#2 sets of samples		
also running pressurized la	an.	
all cans at - 30 Dsi except	AVIIO reading - 2	14
replaced with AVIDB which is	at - 30	, , , , , , , , , , , , , , , , , , , ,
Start at 12:06 145 P	pm Bag stark	dat 12:4
ending pressure on pres . can	29 Jb.	
	•	

(8,1)

	ISPECTION DIARY	•	PROJECT NO.			
DAY:	DATE:	<u> </u>	WORK PERIOD	A.M. P. M. TO	A.M. REPORT NO	
	TEMP. MAX _					
NUMBER AND C	LASS OF PERSONNEL	EMPLOYED:				
					,	
	MAJ	OR EQUIPMENT	ON PROJECT AND	AMOUNT OF	USE	
NO.		DESCRIPTI	ON	_	SIZE/CAPACITY	HRE OP
						-
						+
- FIN	nished Si AL SPAN ON TLES DEF/S	FID @	14:00 HE	= 84	5 8PM (-5 PI	M DRU
					<u> </u>	
				•	*	
				•	*	
				•	-	
				•	*	
					*	
					*	

DAY:	DATE: 0 4 0	291 w	RK PERIOD	A.M. TO	A.M.	-	
	TEMP. MAX					neron) no.	
	AND CLASS OF PERSONNEL EMPI		r: PRECI	MATION	,		
u Canas K	AND CLASS OF PERSONNEL EMPI	LUTED:					
	·					:	
				 .			
							
			PROJECT AND A	MOUNT OF		175 (0 A D A O 150)	1 1120 0000
NO.		DESCRIPTION			- 8	IZE/CAPACITY	HRS. OPER
							
							
				 –			ļ
							<u> </u>
	CCOMPLISHED TODAY:						
	ar Gilian Cal: 10	102	800 cc r	nin @	14	min rea	ding
	ar Gilian Cal: 10	102	800 cc/r	nin Q min C	14	min rea	ding
Tedl	ar Gilian Cal: 10	100	800 CC /	min C	1 i	lmin. re	ding
Tedl	ar Gilian Cal: 10	100	800 CC /	min C	1 i	lmin. re	ding
Tedl	ar Gilian Cal: 10	10:16	800 CC/I	min C	1 i	Imin. re	ading
Tedl	ar Gilian Cal: 10	10:16	800 CC/I	min C	1 i	Imin. re	ading
Tedl	ar Gilian Cal: 10	10:16	800 CC/I	min C	1 i	Imin. re	ading
Tedl	nitoring Well.#	100 10:16 7:::	800 CC/1	nin C	1 i	Imin. re	ading
Tedl	ar Gilian Cal: 10	100 10:16 7:::	800 CC/1	nin C	1 i	Imin. re	ading
Tedl	nitoring Well.#	100 10:16 7:::	800 CC/1	nin C	1 i	Imin. re	ading
Tedl	ort Blanks at nitoring Well # Can pr	100 10:16 7: esswes	eso ce li	PSI=-	*	Imin. re	ading
Tedl	art Blanks at nitoring Well # Can pr Pumped Start # 1 Sai	10:16 7.:: essiwes	eso celi	PSI=- 25	q.co	Imin. re	ading
Tedl	art Blanks at nitoring Well # Pumped Start # 1 Sai	10:16 7:: eggwes all li mples:	eso cc/i	PSI=- 25	q.co	Imin. re	ading
Tedl	art Blanks at nitoring Well # Can pr Pumped Start # 1 Sai	10:16 7:: eggwes all li mples:	eso celi	PSI=- 25	q.co	Imin. re	ading
Tedl	Pumped Start # 1 Sai Charcoal Hub	10:16 10:16 7:: eggwess all li mples: sp. Sp.	eso cc/i	PSI=- 25	q.co	Imin. re	ading
Tedl	art Blanks at nitoring Well # Pumped Start # 1 Sai	10:16 10:16 7:: eggwess all li mples: sp. Sp.	eso cc/i	PSI=- 25	q.co	Imin. re	ading
St Ma	Pumped Start # 1 Sau Charcoal Hub	10:16 7:: esswes all li mples: esse SD, an	nes II:	Pote:	3. co	n. ba	g,
St Ma	Pumped Start # 1 Sai Charcoal Hub	100 10:16 7:: essibles all li mples: scaling smallea	nes III	PSI=- 25 26 26 26	3. co	n. ba	g,
St Ma	Pumped Start # 1 Sau Charcoal Hub	10:16 10:16 7:: cess wes all li mples: sp an smallca all li	nes II:	PSI=- 25 26 26 26	3. co	n. ba	g,
St Ma	Pumped Start # 1 Sau Charcoal Hub	100 10:16 7:: essibles all li mples: scaling smallea	nes III	PSI=- 25 26 26 26	3. co	n. ba	g,

	•		PROJECT NO.	ne .	· , 2
DAY:	DATE: 04 01	O A WORK PERIOR	A.M. TO	A.M. REPORT NO.	
WEATHER_	TEMP. MAX°	_	PRECIPITATION		·
	D CLASE OF PERSONNEL EMPL				
AND MARKET	D COME OF PERSONNEL SIMPS				
					
					
	MAJOR EC	UIPMENT ON PROJECT	AND AMOUNT OF USE		
NO.	0	ESCRIPTION		SIZE/CAPACITY	HRS. OPE
			·		
WORK 4000	MPLISHED TODAY:				
<i>—</i>	instrument modings				
	nn of full of the b	10102 800 C	C/MIN @ 1 4/	MIN READIN	
;	3 241 1 1 1 1	10100 , 800	FAMING &	-MIN LEA	BING
<u> </u>	= 10 CE/MIN	-			
	- Tin Crimin	J			
• •					-
		** = K2			
	1 = 1154 - 64-T-				
	16 4 440 (Class)	· · · · · · · · · · · · · · · · · · ·	·		
					
	••••				
	,				
	La .	•	-		
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	<u>;</u>				

	RESID	INT'S SIGNATURE		ATE	······································

		PROJECT NO.	34 18m2	13.02
DAY:	TE: 04 01 9 1 WORK PE	RICO A.M. TO	A.M. REPORT NO.	
WEATHER TH	P. MAX°F: MIN°F:	PRECIPITATION		
NUMBER AND CLASS OF PE	RSONNEL EMPLOYED:			
<u></u>	MAJOR EQUIPMENT ON PROJE	CT AND AMOUNT OF USE		
NO.	DESCRIPTION	CI AND AMOUNT OF USE	SIZE/CAPACITY	HRE OPER
	1,	<u> </u>		
	1,10			
	\			
į				
WORK ACCOMPLISHED TODA	AY: MW #9			
FID START		•		
#6 159.6	50 6 6			
STANT a !	1:00	.	100	٠ . و
ì		MU # P Zh	47,30 "Hy	
CAN THELLA	11:20 CAN #P	28		
424		1		
#6 = 167.	s cs).			
F10-= 2100		1		
BYPASS = 39	orcelmin)		*	
		a grand 💆	en les la	
:52 \$6 = \$76.	6 CF "PPM=52 -	as the second		
FID 2-316				
PHPMO	الرابيابي ا	••		۸.,
323 Same	colocted - P-38 at	(-30" Ha	Quel	
326 36 = 1	CF - 1 200 = 52	. 3		
FID: 2150				
By 004 = 408 é	. ———		•	
7	collated - P-33 at	<-50" Ha	ta. · ·	
1531 \$6 = 200.7		m By 04-390	Cetain Rin =	53 mm
	box - Singl roding = 201.7	- CF	7	. 1
			1-1	
			A 440	

_13 1.			PROJECT IS	346	art of the
	_	WORK PERIOD			· ·
MEATHER	TED. MAX	°F: MIN°F: PR	ECIPITATION	·	
NUMBER AND CL	ASS OF PERSONNEL E	MPLOYED:			
<u>-</u>	<u> </u>				
	<u> </u>				
	MA 101	T PANELLE ON BROKEN AND			
NO.	MAJO	R EQUIPMENT ON PROJECT AN DESCRIPTION	D AMOUNT OF L	SIZE/CAPACITY	HRE OF
		Tym 1/2 7			
	······································	<u> </u>			
			<u>. ***</u>		
			<u>=</u>		
		·			<u> </u>
YORK ACCOMPLIS	HED TODAY:				
E	HUSTENMANT	SETTINGS IN LE	. P &		3-
# 6 Bo	159.5 2.200 c/s		190	PPM /	yk e
FID &	159.5 2.200 c/s	ATTE	190	DD44	yk e
FID S	2.200 c/s	AIRI	190	DD44	eyk e
FID S	2.200 c/s 2.200 c/s 2.400 c/s 2.400 c/s	O CC/MIN 2 C.O)	190 PPM !	DD44	yk e
FID S	2.200 6/2 2.200 6/2 2XHAUST = 7 3 - 46	T SPAN = 850	190 PPM !	DD44	yk e
FID S	2.200 c/s 2.200 c/s 201AUST = 7 2	T SPAN = 850	190 PPM !	DD44	eyk e
FID & FID & FID & FID & FID &	2.200 c/s 2.200 c/s 201AUST = 7 2	T SPAN = 850	190 PPM !	DD44	yk e
FID & FID & FID & FID & FID &	2.200 c/s 2.200 c/s 201AUST = 7 2	T SPAN = 850	190 PPM !	DD44	yk e
FID & FID & FID & FID & FID &	2.200 6/2 EXHAUST = 7	T SPAN = 850	190 PPM !	DD44	eyk e
FID & FID & FID & FID & FID &	139.5 (2.200 c/s EXHAUST = 7 13 11 11 11 11 11 11 11 11 11 11 11 11 1	T SPAN = 850	190 PPM !	PPM 1: 50	<u> </u>
FID & FID & FID & FID & FID &	2.200 6/2 EXHAUST = 7	T SPAN = 850	190 PPM !	DD44	<u> </u>
FID & FID & FID & FID & FID &	139.5 2.200 c/s EXHAUST = 7 10.3TRUMPN	T SPAN = 850	190 PPM !	PPM 1: 50	<u> </u>
FID & FID & FID & FID & FID &	139.5 2.200 c/s EXHAUST = 7 10.3TRUMPN	T SPAN = 850	190 PPM !	PPM 1: 50	<u> </u>
FID & FID & FID & FID & FID &	139.5 2.200 c/s EXHAUST = 7 10.3TRUMPN	T SPAN = 850	190 PPM !	PPM 1: 50	
FID & FID & FID & FID & FID &	139.5 2.200 c/s EXHAUST = 7 10.3TRUMPN	T SPAN = 850	190 PPM !	PPM 1: 50	\$
FID & FID & FID & FID & FID &	139.5 2.200 c/s EXHAUST = 7 10.3TRUMPN	T SPAN = 850	190 PPM !	PPM 1: 50	<u> </u>
FID & FID & FID & FID & FID &	139.5 2.200 c/s EXHAUST = 7 10.3TRUMPN	T SPAN = 850	190 PPM !	PPM 1: 50	\$
FID & FID & FID & FID & FID &	139.5 2.200 c/s EXHAUST = 7 (1) 113 (1) 113	T SPAN = 850	190 PPM !	PPM 1: 50	\$

(8.1)

FORM 21C

	REPECTION DURY	PAGE		
. •		PROJECT NO.	SAC 28721	4.14
DAY:	3/31 45 DATE: 0.3/3.1/9.1 WORK PERIOD_	A.M. TOA.	M. REPORT NO	·
WEAT	THER TTLY THE MAX F: MIN F: PRI	ECIPITATION		
NUME	BER AND CLASS OF PERSONNEL EMPLOYED:			
Tir	m malohet		· <u> </u>	
5	DERT KOSTER			
			•	
_	MAJOR EQUIPMENT ON PROJECT AN			
NO.	DESCRIPTION	D AMOUNT OF USE	SIZE/CAPACITY	HRS. OPER
	FID ANALYZER JUM VE-7			
2	HONDA GLUZZATOL			†
3	METHOD & GAS SAMPLE CONTROL	Box		
	·			
				
n ; 5 (1.0 L/MIN → BYPASS METHOD 6 BOX INITIAL 122.0 D A.M. O.B YMIN → BYPASS	CF & 11:5	D	
	T - 1 2 40 5 6			
	T CAN PAB INITIAL PRESSURE CA	-30 IN H4		* ****
_	CAN DEAUN & 12:17 PPM=175			
	17:29 BYPASS FLOW = 400 CC/m/W FID = 2.2 1/m/W			
_	FID = 2.2 A/MIN 12:31 #6 = 127.7	<u> </u>		
	——· · · · · · · · · · · · · · · · · · ·		D #9	- DX-2
	13:57. 29M = 184, #6 = 141.5,	TAK	749 IUIT	. r 🕊 🦠
	14:19 = PLPASS = 400 CC/MIN			
·		•		
_	15:04 PPM = 190			
<u>=</u>				
	#6 = 150.4	04.1.5	#S = 2	-0"
			43 INIT P	•
		SAMPLE	0-1643	PPME
	al 4/		lailer	
	TM L/ 14 14 .			

SECTION VII CH2M HILL CHAIN-OF-CUSTODY SHEETS

					REMAKS	Tube			, h	Canskr		,,	Baa					2:30pm			AR BILL
			alfiel	Sent 10 h	,											+		DATE/TIME	DATE/TIME	DATE/TIME	2
>	CLIENT ADDRESS AND PHONE NUMBER	ANALYSES REQUESTED	EIM TO ILL															RELINCUISHED BY ALLOANS CIPLINA	c	RELINGUISHED BY:	SAMPLE SHIPPED VIA
QUALITY ANALYTICS DDY RECORD	SOS Ares D		COPY TO:	SAMPLING REQUIREMENTS SDWA NPDES RCRA OTHER	MPLE DE	1.1.0.1.WM	T-0-1	MIW - S - D - 7 - J	-T 0.7.	MW-40-0-7-1	-AC - C	MW-AC-0-1-5	B-0-7-	MW-8-0-7-2	6.0.7-	ġ,	0 : 1	DATE/TIME 4(2/5)	DATE/TIME	DATE/TIME	DATE/TIME
UALITY A	PROJECT NAME	AFB	C. F.		00.5¢		-											mie Systywe Bulls			
~	PROJECT NUMBER SAC 2 8722 0312	MCCEllan AFB	PROJECT MANAGER	10	DATE TIME	1/2	1	4.5		7/4	7 1	7/17		7 15	7 :	775	7.7	1 ^	RECEIVED BY:	RECEIVED BY:	RECEIVED BY LAB:
w= 2	SAC		15 7	2 2	\$ 0.										1			3.	1 5	ECE.	ECE.

CHEM PAL QUALITY ANALYTICS
CHAIN OF CUSTODY RECORD

MOJECT NUMBER SAC 28722 The	PROJECT NAME	INAME	CLIENT ADDRESS AND PHONE NUMBER	HONE NUMBER		\$13 m
	i.		0 "			
McCle Han	AFE		ANA	ANALYSES REQUESTED		
		COPY TO:	<u> </u>	Ч		
Lobert Kest	1)		7 - 1 - 1 - 2 -	トセイル		
REQUESTED COMP. DATE		SAMPLING REQUIREMENTS SOWA MOES RCRA OTHER	\-Z	3 3 3		
STA NO. DATE TIME	00Ze	MPLE DE	20		7	REMARKS
2/2		MW-B-() . 1				Bac
57)		MW - F 0 - 3 2				
		MW E 0-3 3				707
0.7		MW 5-0-3-3(dex)				(S)
		ilw r. r - : : : : : : : : : : : : : : : : : :				, , , , , , , , , , , , , , , , , , , ,
-		MIL ALL ST				(Lange for land prosent
		1111 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
77		hul 4 6 5-3				
		MILTING COSTS				
		NW-S-WI				7u/c
		7				
7.		JHE 7 - 1				1
	-	1111 - 1 0 - 3 - E				
118	+	NVV - S - O - C - (Chy)				, , ,
SAMPLED BY AND THE		DATE/TIME	RELINQUISHED BY	" Vata D	DATE/TIME	Color of the Color
ECENED BY:		DATE/TIME	RELINQUISHED BY:	ā	VTE/TIME	一日の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本
RECEIVED BY:		DATE/TIME	RELINQUISHED BY:	۵	DATE/TIME	
RECEIVED BY LAB:		DATE/TIME	SAMPLE SHIPPED VIA UPS BUS FED-EX HAP	HAND OTHER	AIR BILL#	
REMARKS				1		ENTERED STATEMED NEWTONED

CHEN PAGE QUALITY ANALYTICS

resonated uniter PENEWED ... REMARKS 1111 INTO UNITS ENTERED \mathbf{M} AIR BILL# DATE/TIME DATE/TIME DATE/TIME ANALYSES REQUESTED CLIENT ADDRESS AND PHONE NUMBER OTHER HAND FED-EX SAMPLE SHIPPED VIA RELINQUISHED BY: RELINQUISHED BY: RELINQUISHED BY BUS 25 * O L UOZr D 8-13 SDWA NPDES RCRA OTHER SAMPLING REQUIREMENTS SAMPLE DESCRIPTIONS (12 CHARACTERS) 1. J. W. 11117 - 1111 111V - 11C DIM: A トーバン 7 - ATT DATE/TIME DATE/TIME DATE/TIME DATE/TIME 7111 COPY TO 212 PROJECT NAME CHAIN OF CUSTODY RECORD ×0--TO:) 0 **~ < ≠** ∪ O **∑** • 10 port Kite PROJECT NUMBER SPC 28722 OS 02 A CELLIN REQUESTED COMP. DATE E E SAMPLED BY AND TITLE PROJECT MANAGER RECEIVED BY LAB: CLIENT NAME RECEIVED BY: RECEIVED BY: REMARKS **₹**9

DEV A/RO ENDNA 140

PATE/THME DATE/THME		CHAIN OF CUSTODY RECORD PROJECT NUMBER PROJECT NAME	CLIENT ADDRESS AND PHONE NUMBER	UMBER	No.	
PONTE SAMPHING SEGUNTEMENTS N CONTROC	CLIENT NAME		0	Concerco		
P DATE SAMPLING RECURENIES	PROJECT MANAGER	COPY 10:	Der Mil	<u> </u>		
C 6 5 SAMPLE DESCRIPTIONS S S S S S S S S S	REQUESTED COMP. DATE	IPLING REQUIREN	(30 \$ C	+ 00		
VR-B-0-31-B	DATE MAE		o w			REMARKS
VR-B-0-31-3 VR-B-0-31-4 VR-B-0-31-1V VR-B-0-31-2V VR-B-0-31-2V VR-B-0-31-1V VR-B-0-31-1V VR-B-0-31-1V VR-B-0-31-1V VR-B-0-31-2V VR-B-0-31-1V VR-B-0-1V VR-B-0-1	S/7	Mrvk-8-0-31-B VR-8-0-31-1				Bags "
VR - B - O - 31 - 1V		, 1 , 1 7				
VR B-0-31-3V		7 2 2				Contonsak Vials
TK 11C - 31-2V VR AC - C-31-2V VR AC - C-31-2V VR AC - C-31-2V VR AC - C-31-2V PELINQUISHED BY DATE/TIME		377			3	
THE EAST IN DATE/TIME		AC-C-31				
DATE/TIME		6.3				
DATE/TIME RELINQUISHED BY: DATE/TIME RELINQUISHED BY: DATE/TIME	SAMPLED BY AND TITLE 1-1. 11.	DATE/TIME	BELINGUISHED BY	DATE/IIME	1	
DATE/TIME RELINQUISHED BY:			PALINGUISHED BY:	DATE/TIME	· unfan	
	RECEIVED BY:	DATE/TIME	RELINQUISHED BY:	DATE/TIME		
RECEIVED BY LAB: DATE/TIME SAMPLE SHIPPED VIA	RECEIVED BY LAB:	DATE/TIME	CNAM		IR BILL#	

CHANGE CUSTODY RECORD

MORE	D.R.C. HAMER		12,	ECI.			CLIENT ADDRESS AND PHONE NUMBER			
SAC 28722.03	8122	8	B		Jas Area U	• 0 •				
Σ	McClellan AFB	Man 1	~	FF	8		ANALYSES REQUESTED			
PROJECT MANAGES	MANG	=			COPY TO:	υo	EPA TO-14/Connie	Hers		
Robert Koster	ナ	oste	L			2 -	diffied 10-0	sor bents		
	D COMP. DATE	DARE			APLING REQUIRES	<-	EIC. AS FER NCORN	1,00 0		3.
					SDWA NPDES RCITA OTHER	Zw	Supplied Sup			
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18	DATE	TIME			(12 CHARACTERS)				REMARKS	***
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